THE

AMERICAN GAS-LIGHT JOURNAL

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Iron Buildings, Nos. 254 & 256 Canal Street, East, near Broadway, New York.

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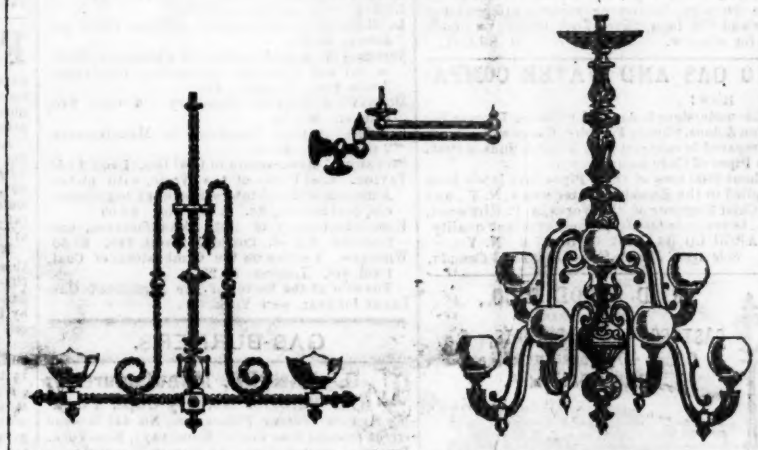

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They are self-regulating, gas-purifying indestructible, and most economical.

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See Engravings in Nov. 1, 1860, page 144.

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ANTI FREEZING APPARATUS

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According to Professor Faraday, the watery vapor contained in illuminating gas amounts to 0·0093 parts where the gas is at a temperature of 40°, or in other words, that there are 1, 7-10 *gills water in every* 1,000 *cubic feet of gas* at that temperature. It is the deposit of this water in the *form* of frost that closes the exposed pipes.

Walton's plan is, in a few words, to supply this water with a sufficient quantity of alcohol (98-100ths), the vapor of which will enable it to pass through the most exposed pipes, unaffected by frost. Experiments of three years prove that one gill of such alcohol will protect 1,000 feet of gas at any temperature. Private houses, Hotels and Gas-works, can be thus guarantied from frost by the use of Walton's Anti-Freezer, which consists of but two or three small castings, at the most trifling cost. It can be applied at Gas-works without altering any of the pipes; and the expense of labor and the alcohol will not exceed two cents per 1,000 feet of gas.

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Yours truly, JOHN JEFFREY.

OFFICE LOUISVILLE, KY., GAS CO., March 30th, 1860.

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The application of a vessel, containing a small quantity of alcohol, placed between the gas main and an open area connected with a building, through which the service pipe was laid, has always prevented the freezing or stoppage of the service pipe, although the temperature may have ranged from the freezing point to several degrees below zero.

As the alcohol absorbs from the gas any vapor of the water that may be passing off with it, after passing the vessel containing alcohol, there remains in the gas nothing that can freeze or close the pipe. *This simple application, we have proved to be an effectual safeguard against the closing of gas pipes with frost.*

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WATER-GAS.—APPLETON & GRAHAM,

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31 Race Street, Cincinnati, Ohio.

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STOCKS, DIES, AND TAPS OF ALL SIZES. CAST IRON PIPE AND GAS-METERS.

ALL GOODS WARRANTED.

GENGEMBRE'S PATENT

NON-FREEZING AND NON-EVAPORATING

GAS-METER FLUID.

The Gas Companies that have given this Fluid a careful investigation, have become purchasers of the right to use it!

It costs less than one-fifth the price of *alcohol;* and will not *Freeze, Evaporate,* or deteriorate from continued use!

PROF. JOHN TORREY,

CONSULTING CHEMIST OF THE MANHATTAN GAS-LIGHT COMPANY,

Certifies, that "it will not corrode the metals of which the meters are constructed, and that it will not freeze or evaporate."

JOSEPH A. SABATTON, Esq.,

ENGINEER OF THE MANHATTAN GAS-WORKS,

Certifies, that "a meter was set up in January last, outside of the works, and filled with this Fluid, it was in constant use, and did not fail to register during the winter, and there was no perceptible variation of the water-line."

JAS. THOMPSON, Esq.,

ENGINEER OF THE PITTSBURG, PA, GAS-WORKS,

Says, that "having become satisfied, after continued experiments of more than nine months, that this Fluid will answer the purpose it is designed to accomplish, we filled all our customers' meters with it during the past winter, and have had no trouble with any of them."

O. G. LEOPOLD, Esq..

SUPT. DAVENPORT, IA., GAS-WORKS,

Certifies, that "having exposed a meter filled with this Fluid for a period of eight months to an out-door temperature. both heat and cold, we find it possesses the properties claimed for it by the patentee."

BENJ. HARPER, Esq.,

SUPT. ROCK ISLAND, ILLS. GAS-WORKS.

Certifies, "The meters of this Company have been filled for over two years with the Gengembre Patent Gas-Meter Fluid. They have never failed to register during winter, and the level of the Fluid remains constant."

With such evidence of its utility, is there a Gas-Company who will not secure to themselves the right of use, which may be obtained on the most reasonable terms, by addressing

A. L. BOGART,

Office, 592 Broadway, New York.

NOTICE.

Having appointed A. L. BOGART, Esq., my sole Agent and Attorney, for the sale of rights under my patent within the six New England States and for the State of New York, all sales that may be made by him will be ratified by my signature.

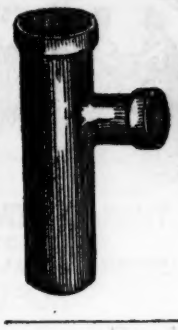
H. P. GENGEMBRE, Patentee.

PHILLIPS & ALLEN,

Pensylvania av., above 22d st., Philadelphia.

GASOMETER RIVETS.

Every kind of Rivets used in Gasometers.



GAS, STEAM, SMOKE,

PURE WATER & SOIL PIPE

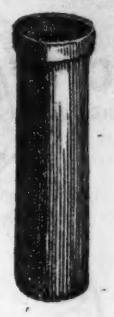
FROM

JOSEPH CLIFF,

Wortley Fire-Brick Works, Leeds, Eng.

T. W. PARMELE, Agt.,

No. 4 Irving Place, N. Y.



ENAMEL DIALS FOR GAS AND WATER METERS

BOTTOMLEY & HINES, MANUFACTURERS, West Philadelphia, Pa.

The best, therefore the cheapest for Gas and Water Meters and Engineers' Indicators.

These Dials are particularly adapted to all purposes where gas, gas-vapors, or acids, are present. Also, Watch and Clock Dials of every description, from any size up to 14 inches diameter.

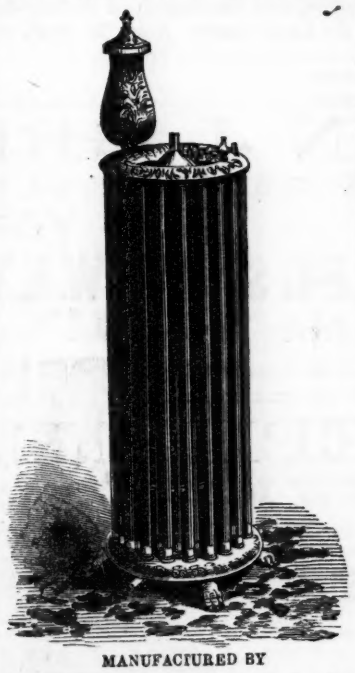
The undersigned embrace this opportunity of returning their thanks to the gas-meter manufacturers throughout the United States, for the very liberal patronage they have received for the past ten years, during which they have been established in Philadelphia, which has placed us ahead of all competition. Our sales for the past year have been far greater than we could have anticipated, with the prospects of a steady increase. Our constant aim has been, and will be, to adopt all improved processes of manufacture, combining improvementin uality with reduction in price All Dials made by us are warranted to be as represented, and of the best materials and workmanship, which will recommend them to all parties wishing the very best. Circulars sent free by mail, or on application.

We are the appointed agents for HUNTER, SHEARMAN & CO.'S make of BRASS PINION-WIRE Gas-meters. which we believe is equal to the best.

HEATING APPARATUS.

STEAM & HOT WATER Heating.—We are prepared to Heat Public and Private Buildings with Hot Water or Steam, in the most substantial manner, at low prices. Estimates given for work in any part of the country, by RICHARDSON, BOYNTON & CO, No. 260 Canal-st., N. Y.

HOT WATER GAS-STOVE.



MANUFACTURED BY

HUNTER, KELLER & Co.,

144 Centre-st., N. Y.

STEAM DOMESTICATED.—Low Pressure Steam for Domestic Warming, an Apparatus which is simple, durable, economical, and perfectly safe. Estimates given and work done in any part of the country.

Descriptive pamphlets furnished on application to BAKER, SMITH & CO., Sole manufacturers, Nos. 180 and 182 Centre street, N. Y.

GEORGE L. CANNON, Successor to the Rippowam Co., 54 East 13th street, between Broadway and University Place manufacturer and dealer in Air, Water, and Steam Warming and Ventilating Apparatus, Cooking Ranges, Range Furniture, Registers, Ventilators, &c.

Particular attention given to Heating Churches School Houses, Public Buildings, &c.

OLEOMETERS.

OLEOMETER, OR HYDROMETER. For Kerosene, Coal Oils, Petroleum and other Distilled Oils. Scale by Dr. Gesner. Manufactured and sold by G. Tagliabue, 298 Pearl street, New York. The specific gravity for every degree of his hydrometer has been carefully taken, and the instrument adapted to the above oils. A table of specific gravities, compared with Baume's scale, a Thermometer and Test-Glass, accompany this new instrument, put up in a neat case—price $5—and it will be found of great importance to manufacturers, and dealers in all coal and petroleum oils.

G. TAGLIABUE, 298 Pearl-st., New York.

SITUATIONS WANTED.

TO GAS-METER MAKERS.—E. PRITCHARD, (late Foreman of S. Down,) invites the attention of capitalists, and those interested in the manufacture of Gas-Meters, with a view to an engagement. Has a thorough knowledge of the business. Good references given. Address 304 9th avenue, New York.

WANTED—A Situation as Manager of a Gas-Works, by a person of experience, and a borough Practical Gas-Engineer. Good references. Address A. J. M., Rooms of AMERICAN GAS-LIGHT JOURNAL.

A COMPETENT GAS-ENGINEER wishes a situation in a Gas-Works. Address ENGINEER, Rooms of AMERICAN GAS-LIGHT JOURNAL.

WANTED.—The Subscriber, a Practical Gas Man, of many years' experience, wishes a situation to control or work a small Gas Works; is a practical Retort Setter, Pipe Layer; understands the various departments of Gas-Lighting, and would assist in the erection of Gas-Works. Unexceptionable references. Apply to W. H C., at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

A GAS ENGINEER who has been superintending Works for several years, wishes to find a place as such. The best references can be given. A Southern place preferred. Direct to L. P. W., at Rooms of the AMERICAN GAS LIGHT JOURNAL.

GAS-COAL.

CLEVELAND, O., Nov. 28, 1860.

THE PARTNERSHIP heretofore existing under the name of Butts & Kendall, has expired by its own limitation with the close of the business of the present season.

F. BUTTS & CO.,

will hereafter have the control of the mines of the STERLING COAL AND MINING COMPANY, and with such increased facilities, both as to improvements perfected at the mines and transportation of coal, as will enable them to continue the business on a more extensive scale than heretofore in *supplying Gas-Light Companies* in the different States, both East and West.

We are now prepared to contract for the delivery of the CELEBRATED STERLING COAL for the coming season; also, Pittsburg and other varieties of GAS-COALS.

You will therefore please to address, in relation to such contracts, F. BUTTS & CO., Post-Office Drawer, 74. Cleveland, Ohio.

LIVERPOOL AND NEWCASTLE CANNEL & COAL,

FOR

Gas-Manufacturers and House Use.

The careful shipment of the best qualities, of Cannel and Coal, at the lowest rates current at the time of engagement guaranteed.

T. W PARMELE, Agt., No. 4 Irving Place, New-York.

GAS-CANNEL COAL,

AND

APPARATUS,

SUPPLIED BY EMANUEL TURNER & CO., Export Offices, 34 Castle-st., Liverpool.

See Advertisements in Vol. 1, of AMERICAN GAS-LIGHT JOURNAL.

CANNEL AND ORREL GAS-Coal.—The Subscribers are constantly receiving direct, from the celebrated mines of WILLIAM H. BRANKER & CO., NEWCASTLE, ENG., COAL of the very first quality for gas purposes, which they will sell direct from ship or from yard at the lowest market price; and we guarantee the coal to be equal if not superior to any other coal brought to this market.

CORNELIUS BAKER & SON,

61 Leonard st. and 652 Hudson st., New York

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

BOSTON, MASS., 1 BARRETT STREET,—AUGUST 2, 1860.

RICHARD GLOVER begs to inform GAS COMPANIES, and CONTRACTORS, that he has always on hand a large assortment of THOMAS GLOVER'S (of London) celebrated DRY GAS METERS.

THOMAS GLOVER'S Meters have now been in use in the United States and British Provinces, for the last FOURTEEN YEARS, and are extensively used by many Gas Companies, to their entire satisfaction; and R. GLOVER can with all confidence, refer to them in proof that THOMAS GLOVER'S Meters are—the most PERFECT in PRINCIPLE—the most CORRECT in REGISTRATION—and more DURABLE than any other Dry Gas Meter made in the United States or Great Britain. R. GLOVER will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of Thomas Glover's manufacture, and of a more recent date than THREE years, he will make no charge

Suffolk Street, Clerkenwell, London, and 1 Barrett Street, Fulton Street, Boston, Mass.

SAMUEL DOWN,

Nos. 340, 342, 344 and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURER OF

WET AND DRY PATENT GAS METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy and several other distinguished scientific gentlemen.

JOHN J. GRIFFIN & CO.,

No. 7 BEEKMAN Street, and 76 West 37th Street,

NEW YORK CITY,

MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

JOSEPH LENNIG & CO.,

Nos. 313 & 315 NEW MARKET-St., above Vine-St., Philadelphia, Penn.,

MANUFACTURERS OF

WET AND DRY

PATENT

GAS-METERS,

STATION,

SHOW, CUSTOMER,

AND

EXPERIMENTAL

METERS,

PHOTOMETERS,

PRESSURE REGISTERS,

INDICATORS,

AND

GUAGES,

GOVERNORS, METER PROVERS,

CENTRE SEALS,

FLUID GUAGES, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us. Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired.

METERS REPAIRED AND FORWARDED WITH DISPATCH.

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas works and water-works, and the various manufacturers may see where are new openings for business. And as each post master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL for distribution, the number thus circulated will probably exceed *Three Millions of Copies. What a chance for advertisers!*

We supply, to day, the post-offices in Connecticut, a wealthy, prosperous, enterprising State, full of Yankee clocks and wooden nutmegs; a State that always minds its own business, pays its debts and never gets into a row with other States; and is already increasing its gas-works, water-works, and other internal improvements. All hail, Connecticut!

POST-OFFICE TOWNS IN THE UNITED STATES,

ARRANGED BY STATES AND COUNTIES,

Shewing where Gas Works and Water-Works are Wanted.

CONNECTICUT.

8 Counties, 373 Towns, 14 Gas-Works, 5 Water-Works.

Fairfield County.

Ball's Pond,	Huntington,	Saugatuck,
Banksville,	Limestone,	Sherman,
Bethel,	Long Ridge,	Smith's Ridge,
Black Rock,	Mianus,	South Norwalk,
Bridgeport,	Mill Plain,	Southport,
Brookfield,	Monroe,	Stamford,
Cold Spring,	New Canaan,	Stanwich,
Danbury, (c. h.,)	New Fairfield,	Stepney,
Darien,	Newton,	Stepney Depot,
Darien Depot,	North Greenwich,	Stratford,
Easton,	North Stamford,	Trumbull,
Fairfield, (c. h.,)	North Wilton,	Trumbull Long Hill,
Georgetown,	Norwalk,	Weston,
Glenville,	Redding,	Westport,
Greenfield Hill,	Redding Bridge,	West Norwalk,
Greenwich,	Ridgebury,	West Redding,
Hawleyville,	Ridgefield,	Wilton,
High Ridge,	Round Hill,	Winnipauk.

Hartford County.

Avon,	Glastenby,	Scitico,
Berlin,	Granby,	Simsbury,
Bloomfield,	*Hartford*, (c. h.,)	South Glastenbury,
Bristol,	Hartlandt,	Southington,
Broadbrook,	Hazardville,	South Manchester,
Buckland,	Hockanum,	South Windsor,
Burlington,	Kensington,	Suffield,
Canton,	Manchester,	Tariffville,
Canton Centre,	Manchester Station,	Thompsonville,
Collinsville,	Marion,	Unionville,
Curtisville,	Marlboro',	Warehouse Point,
East Berlin,	New Britain,	West Avon,
East Granby,	Newington,	West Granby,
East Hartford,	North Canton,	West Hartford,
East Windsor,	North Granby,	West Hartland,
East Windsor Hill,	Plainville,	West Suffield,
Enfield,	Plantsville,	Wethersfield,
Farmington,	Poquonock,	Windsor,
Farmer's Village,	Rainbow,	Windsor Locks,
Forestville,	Rocky Hill,	Windsorville.

Litchfield County.

Bakersville,	Lakeville,	Plymouth Hollow,
Bantam Falls,	Lanesville,	Roxbury,
Barkhamsted,	Lime Rock,	Salisbury,
Bethlehem,	*Litchfield*, (c. h.,)	Sharon,
Bridgewater,	Marble Dale,	South Canaan,
Barrville,	Merwinsville,	South Farms,
Campville,	Milbrook,	South Kent
Canaan,	Milton,	South Norfolk,
Chapinville,	New Hartford,	Southville,
Colebrook,	New Hartford Centre,	Terrysville,
Colebrook River,	New-Milford,	Torringford,
Cornwall,	New Preston,	Torrington,
Cornwall Bridge,	Norfolk,	Warren,
Cornwall Hollow,	North Cornwall,	Washington,
East Canaan,	North Colebrook,	Watertown,
Ellsworth,	Northfield.	West Cornwall,
Falls Village,	North Goshen,	West Goshen,
Goshen,	North Norfolk,	West Norfolk,
Harwinton,	Northville,	West Winsted,
Hitchcockville,	Ore Hill,	Winchester,
Hotchkissville,	Pequabuck,	Winchester Centre,
Huntsville,	Pine Meadow,	Wolcottville,
Joyceville,	Pleasant Valley,	Woodbury,
Kent,	Plymouth,	Woodville.

Middlesex County.

Centre Brook,	Essex,	*Middletown*, (c. h.,)
Chester,	*Haddam*, (c. h.,)	Millington,
Clinton,	Haddam Neck,	Moodus,
Cobalt,	Hadlyme,	North Killingsworth,
Cromwell,	Higganum,	Portland,
Deep River,	Killingworth,	Saybrook,
Durham,	Leesville,	Saybrook Ferry,
Durham Centre,	Middlefield,	Westbrook,
East Haddam,	Middle Haddam,	Winthrop.
East Hampton,		

New Haven County.

Ansonia,	Mount Carmel,	South Britain,
Beacon Falls,	Naugatuck,	Southbury,
Bethany,	*New Haven*, (c. h.,)	Southford,
Branford,	North Branford,	Stoney Creek
Brook's Vale,	Northford,	Wallingford,
Cheshire,	North Guilford,	Waterbury,
Derby,	North Haven,	Waterville,
East Haven,	North Madison,	West Cheshire,
Fair Haven,	Oakville,	West Haven,
Guildford,	Orange,	West Meriden,
Hamden,	Oxford,	Westville,
Madison,	Prospect,	Whitneyville,
Meriden,	Rockland,	Wolcott,
Middlebury,	Seymour,	Zoar Bridge.
Milford,		

New London County.

Bozrah,	Ledyard,	*Norwich*, (c. h.,)
Bozrahville,	Liberty Hill,	Norwich Town,
Centre Groton,	Lisbon,	Pendleton Hill,
Chesterfield,	Lord's Bridge,	Poquanoc Bridge,
Colchester,	Lyme,	Poquetanock,
Franklin,	Montville,	Preston,
Gate's Ferry,	Mystic,	Salem,
Gardner's Lake,	Mystic Bridge,	South Lyme,
Greenville,	Mystic River,	Stonington,
Griswold,	*New London*, (c. h.,)	Uncasville,
Groton,	Niantic,	Waterford,
Hamburgh,	Noank,	West Chester,
Jewett City,	North Lyme,	Yantic.
Lebanon,	North Stonington,	

New London County—*Continued.*

Andover,	Mansfield Depot,	Square Pond,
Bolton,	Mashapaug,	Stafford,
Columbia,	Merrow Station,	Stafford Springs,
Coventry,	Moose Meadow,	Staffordville,
Coventry Depot,	Mount Hope,	*Tolland*, (c. h.,)
Eagleville,	North Somers,	Union,
Ellington,	Quarryville,	Vernon,
Gilead,	Rockville,	Vernon Depot,
Hebron,	Somers,	West Stafford,
Mansfield,	Somersville,	West Willington,
Mansfield Centre,	South Coventry,	Willington.

Windham County.

Abington,	Moosop,	Sterling,
Ashford,	New Boston,	Sterling Hill,
Brooklyn, (c. h.,)	North Ashford,	Thompson,
Campbell's Mills,	North Windham,	Voluntown,
Canterbury,	North Woodstock,	West Ashford,
Central Village,	Oneco,	Westford,
Chaplin,	Phœnixville,	West Killingly,
Colliamer,	Plainfield,	Westminster,
Eastford,	Pomfret,	West Thompson,
East Killingly,	Pomfret Landing,	West Woodstock,
East Woodstock,	Putnam,	Willimantic,
Fishersville,	Scotland,	Windham,
Hampton,	South Killingly,	Woodstock,
Killingly,	South Windham,	Woodstock Valley.

A GAS-ESCAPE INDICATOR.

THE ORGAN OF SAFETY FOR GAS APPARATUS.

The escape indicator, as described by its inventor, at a meeting of the members of the scientific press, has three distinct features; but, which cannot be separated from each other, so intimate is their connection, without loosing one or more of the qualities belonging to all when combined.

Firstly, then, the *compressor* is an active organ whose principal business is to compress, or to expand.

Secondly, the *eprouvette* (gauge) is a passive organ, whose function is to indicate in an ostensible and tangible way, in any position whatever, either the compressed or rarified state of the gas, whether it is fugitive or constant.

Lastly, the *tap* may be considered as an auxiliary organ, or a service tap of safety and protection, placing the indicator in connexion with the gas fittings, or disconnecting them from each other, and either with, or from the surrounding atmosphere.

The most important characteristic of the escape-indicator, with respect to its principal function, is its capability of being permanently placed upon the fittings; thus enabling the consumer to test, at any moment, the condition of the burners, taps, pipes, joints, &c.; and it is this permanency only, that can give full, constant and active security, a desideratum which has long been sought for. Thus attached to the fittings, it would watch the whole affair, acting for itself, needing no help from the surrounding air, and not regarding external circumstances; it would declare the state of the whole of that of which it forms an integral part. Pressure upon the compressor would reduce the capacity of the container, and consequently act upon the contents, by the simple fact of reduction or compression of the holder, which pressure would be indicated by the enlargement of the eprouvette, a sort of *manometer* easily understood, even by a child. If there is no leakage, the compression remains, and the eprouvette, continues to indicate as much; while on the contrary, if there is an escape, the equilibrium of the interior pressure and the atmospheric pressure is restored, and the eprouvette contracts.

Up to this moment the tap has only served to open or close the communication between the indicator and the pipes, which is indeed its principal business, and it answers the purpose fully, but used in the manner we are about to describe, it will be found to be infinitely more valuable.

The chamber is pierced by four holes, placed in form of a square, and which correspond with four small pipes communicating with them; one with the compressor, another with the fittings, a third with the eprouvette and the fourth with the exterior air. The plug, on the contrary, has only three orifices, in the form of a T, and consequently, can only correspond with three of the holes in the chamber; and as the holes of the plug are pierced so as to retain a perfect guard upon the chamber, it can be placed in eight different positions upon it, three of which acting within the limits of a quarter circle, and governed by fixed stops, give value to the indicator in the hands of the consumer.

In the first position, the tap opens communication with the compressor, the eprouvette and the gas fittings.

In the second position, it closes the communication with the fittings and opens one with the atmospheric air.

In the third position, intermediate between the two preceding ones, it interrupts all communication, isolates the compressor, the eprouvette and the fittings from each other, and from the external air.

We shall see, in a moment, that the gas in the fittings will never be in direct contact with the outside air, and that the organs of the indicator itself can never be in connexion with the atmosphere and the gas at the same time. We have said above that the compressor can verify the contents of the delivery pipes without assistance from the atmospheric air; but if the consumer prefers this aid, he can obtain it by means of the tap. After having injected into the pipes to be examined, the air contained in the compressor, he can place the tap in the second position and allow the compressor and the eprouvette to contract; if he afterwards brings the tap to the first position, the compressed air in the fittings will return, part into the compressor and part into the eprouvette, which will become inflated; thus we have a constant indication by means of the inflation.

We can also obtain the same indication by means of contraction; by proceeding in the reverse manner and expelling the air contained in the compressor (second position of the tap) and then bringing the tap to the first position, the air contained in the fittings finding more room, will expand and fill said compressor, and the eprouvette will show it by exhaustion.

But how do we obtain the two opposite effects by one and the same instrument (the compressor?)

By means of the service tap, and the manner in which we proceed, the compressor exercises one or other of these two powers, that have not hitherto been united in the same instrument. We can cause it alternately and without changing its position or disposition either to compress or expand, to *inhale* or *exhale*.

The immediate consequence is, that it makes the escape breathe, it in fact possesses exactly the faculties of the human lungs, besides the power of preserving at each new respiration, the advantages of the pressure or expansion of the preceding one. Besides, our escape indicator is not satisfied with announcing the existence of a leak, but it measures its importance by the time that the eprouvette takes to contract, and as a crowning work it declares the locality by making it breathe, (or whistle) with a force proportionate to the extent to which it forces the inhalation or exhalation.

We might call this an organic faculty of the indicator, and its powers may be variously applied. First it permits a little instrument, unimportant in size and which may be carried in the waistcoat pocket, to sound or examine by the ear, conductors of the largest dimensions, it saves the gas man the troublesome and unhealthy job, which is so frequently necessary, of sucking the lead or brass pipes which are often encrusted with verdigris; and enables him to find the leaks with much greater certainty, without applying the mouth, which is a disgusting and dangerous method.

This same faculty will allow us to avoid those long trenches which hinder the traffic of our streets and highways, and are so many radiators for the distribution of the deleterious gas. Now that we can sound the apparatus, and determine before hand where the leak will be found, we need only make a few holes or cuttings, and one or two experiments will instruct us on which side to seek, and will direct us with certainty, for we shall have the indicator to guide us, and that never deceives. It not only is able to test the gas fittings of the greatest extent, but it will verify itself and each of its organs. To do this, the operator has only after having thrown out the air naturally contained in the compressor, either into the pipes or to the atmosphere, and by the same action either enlarged or contracted the eprouvette, to bring the tap to the third position, that is, of isolation from all the organs in presence, then if the compressor fills itself, and the eprouvette enlarges or decreases, it is because the indicator is out of repair and needs looking to; if, on the contrary, nothing moves, the indicator is perfect, and the defect is in the pipes.

Nothing can be easier than the management of this instrument, which accommodates itself to want, place and circumstance, and is neither fragile nor complicated.

We will not here examine into the originality of the instrument, in its *entirety*, or in its features, either separately or in combination, or their application.

The novelty of the invention arises from the novelty of the results obtained, of which the principle is, we repeat, that for the first time, the consumer can economically and without loss of time, satisfy himself as to the condition of his gas fittings. It is this result which gives the consumers that security which they have never yet enjoyed, and which alone ought to be sufficient to gain the sympathy of the public, of the gas companies and of the gas-fitters, since it promises to increase the demand for gas-light, and will be a preservative against accidents arising from escapes of gas, accidents which, in France especially, have set the public against a more universal application of gas-ighting.—*Le Gaz.*

UTILIZATION OF SEWAGE.—Mr. Richard Dover, of Baker street, of whose system we have before now spoken, is again calling the attention of the parochial authorities of the metropolis to the expediency of utilizing and deodorizing all the sewage and waste water of the various districts throughout London. He proposes to establish in each of the parishes, large filtering tanks, or reservoirs, in which the sewage will be received, and then and therein to treat it with an infusion of muriatic acid and sundry chemical salts, which have the effect, in little more than five minutes, of disengaging the solid sewage from the liquid, which latter comes out "in a purified and transparent stream, useful for flushing sewers, watering roads and other purposes; while the residuum or solid matter precipitated, furnishes, according to the attestation of eminent chemists, a guano or manure full of the most fertilizing ammoniacal matters, and valued at from £2 to £2, 12s. per ton." Mr. Dover estimates that the sewage of the entire metropolis may be deodorized and utilized in this way for a 3d. rate instead of a 6d. rate as now proposed by the main drainage system, besides entirely preventing the pollution of the Thames. The vestry of St. Martin's-in-the-Fields have, we understand, examined Mr. Dover's system, and consider it to be of such great national sanitary importance, that the public welfare demands its immediate and more ample test.—*London Builder.*

"I RISE TO SEEK THE LIGHT."

I saw a little blade of grass,
Just peeping from the sod,
And asked it why it sought to pass
Beyond its parent clod?
It seemed to raise its timid head,
All sparkling, fresh and bright,
And wondering at the question, said,
"I rise to seek the Light."

I asked the eagle why his wing
To ceaseless flight was given,
As if he spurned each earthly thing,
And knew no home but heaven?
He answered, as he fixed his gaze,
Undazzled at the sight,
Upon the sun's meridian blaze,
"I rise to seek the Light."

I asked my soul, what means this thirst
For something yet beyond,
What means this eagerness to burst
From every earthly bond?
It answers, and I feel it glow
With fires more warm, more bright,
"All is too dull, too dark below,
I rise to seek the Light."

LOUIS S. D. REES.

ON THE PREPARATION OF ARTIFICIAL COLORING MATTERS WITH THE PRODUCTS EXTRACTED FROM COAL TAR.

BY M. E. KOPP.

[*Abridged from the Moniteur Scientifique, t. ii., liv. 36.*]
Translated for the *Journal of Gas-Lighting*.

(*Concluded from page* 154.)

Artificial preparation of Aniline by the reproduction of Nitrobenzole.—This process, which constitutes one of the most curious and important reactions of organic chemistry, allows us to obtain aniline in any quantity. It is not difficult to prepare, but certain precautions are necessary when operating on a large scale.

The process may be subdivided into three distinct operations.

1. Preparation of benzole.
2. Transformation into nitrobenzole.
3. Reduction of nitrobenzole to form aniline.

1. *Preparation of benzole.*—The only process we have space to notice is that by which benzole is obtained on a large scale—viz., the extraction from coal tar, or from the first products of the distillation of coal tar, light oil, or crude naphtha.

The manufacturer who wishes to distil tar in order to procure the largest amount of benzole, should choose a light fluid tar, and preferably one distilled from Boghead or cannel coal. To form a comparative estimate of the value of different tars, the following experiment may be performed: About 20 pints of the tar are distilled until the vapors, instead of condensing into a liquid, furnish a product which, on cooling, becomes solid, or of a buttery consistence. By carefully observing when the condensed oil becomes heavier than the water, and measuring the volume of the lighter oils which float on the surface of the water, and then comparing the volumes, we are enabled to estimate with tolerable accuracy the value of the tar. Of course, that which yields the largest amount of light oil is the best.

Some account of the process of distillation was given in the paper by Mr. Mansfield, in the *Quarterly Journal of the Chemical Society*, i. p. 244, to which we refer the reader.

Crude naphtha, or the benzole of commerce, is generally a yellow or brown liquid, having a density varying from ·90 to ·95; it usually contains, besides benzole, some of the homologues of benzole, toluol, cumol and cymol. It is impossible to separate these bodies by an ordinary process of rectification; for although the boiling point of toluol is 108° or 109°, and that of cumol 143° or 145°, their vapors are, so to say, dissolved in the vapor of benzole, and are carried over and condense together. Their presence, however, need not interfere with the preparation of nitrobenzole and aniline.

The benzole found in commerce is at times very impure; some, indeed, has been met with containing but a trace of real benzole. Such an article is generally the result of the distillation of bituminous schists or asphaltum; and, besides hydrocarbons belonging to another series than that of benzole, it generally contains a small amount of oxygenated products, and consequently cannot be advantageously used in the preparation of aniline. It is therefore important to be able readily to detect benzole in a mixture of other oils. For this purpose we may avail ourselves of the facility with which true benzole is converted into nitrobenzole, and then into aniline by the action of nascent hydrogen.

The following is Hofmann's method: A drop of benzole is heated in a small test tube, with fuming nitric acid, to convert it into nitrobenzole. A good deal of water is then added to precipitate the nitrobenzole in mall drops, which must be taken up by ether. The etherial solution is then poured into another small tube, and equal volumes of alcohol and dilute hydrochloric acid are added; a few fragments of granulated zinc are then dropped in. In about five minutes, sufficient hydrogen will have been disengaged to produce aniline, which will be found combined with the acid. The liquid is supersaturated with an alkali, and shaken with ether, which dissolves the aniline set free. A drop of this etherial solution allowed to evaporate on a watch-glass, and mixed after the evaporation of the ether, with a drop of a solution of hypochlorite of lime, will show the violet tints which characterize aniline. The operation may be executed very rapidly, and without any difficulty.

Properties of Benzole.—At the ordinary temperature benzole is seen in the form of a colorless very fluid liquid, of an agreeable (?) odor, and having the specific gravity ·85 at 15° C. At a very low temperature it crystallizes or forms a mass like camphor, which melts at 5°. Its boiling point is between 80° and 81°, and it distils without undergoing any change. It is nearly insoluble in water, to which, however, it imparts its peculiar odor; it is very soluble in wood spirit, ether, alcohol, the essential and the fatty oils; and it easily dissolves camphor, wax, fatty matters, india rubber, gutta-percha, and a great number of resins. Among the last, those which are least soluble in it are shellac, copal, and anime. It is very inflammable, and burns with a brilliant smoky flame. Hydrogen gas passed through it, and charged with its vapor, burns with a very clear, luminous flame.

Chlorine and bromine convert benzole into the terchloride and terbromide of benzole. In direct solar light, the change takes place very quickly. Concentrated sulphuric acid dissolves benzole, and when the mixture is gently heated, a copulated acid, sulphobenzilic acid is formed, $C_{12}H_6S_2O_6$, the hydrogen of which may be replaced by metals. As this acid is soluble in water, we see that in purifying rough benzole with sulphuric acid, it is necessary to avoid using an excess of the acid, and also heating the mixture. A solution of chromic acid does not act on benzole, and is therefore a good agent for the purification. Concentrated nitric acid converts benzole into nitrobenzole, to the manufacture of which we next proceed.

Preparation of Nitrobenzole.—The preparation of nitrobenzole is accomplished on the large scale, by allowing a fine stream of benzole, and another of the strongest nitric acid to run together in a worm, or long glass tube kept well cooled. The two liquids react on each other on coming in contact, heat is disengaged, and nitrobenzole is formed. Commercial nitric acid, mixed with half its volume of sulphuric acid, may be substituted for the concentrated nitric acid. The nitrobenzole collected at the end of the worm, is first washed with water, then with a solution of carbonate of soda, and afterwards once again with water.

Nitrobenzole is a yellowish liquid, which at 15° C. has the specific gravity 1·209. It boils at 213°, and, cooled to 3°, it crystallizes in needles. Having an odor closely resembling that of the essential oil of bitter almonds, it has been largely used in perfumery for scenting fancy soaps, for which purpose it has one advantage over the oil of bitter almonds—it is less affected by the action of alkalies. It is almost insoluble in water, but is very soluble in alcohol, ether, and the essential oils. Concentrated nitric and sulphuric acid dissolve it, but it is precipitated on the addition of water. It is decomposed by continued boiling with concentrated sulphuric acid, and, under the same circumstances, with concentrated nitric acid it forms binitrobenzole. Neither the alkalies in strong aqueous solution, nor quicklime, act on nitrobenzole; but an alcoholic solution of the alkalies acts energetically, and forms azoxybenzole ($C_{24}H_{10}N_2O_2$). By the action of nitric acid on this last substance, a number of other interesting bodies are produced, which, however, it is not necessary now to describe.

Transformation of Nitrobenzole into Aniline.—This is effected by a variety of processes, which we shall proceed to describe in detail.

1. *By means of sulphide of ammonium.*—An alcoholic solution of nitrobenzole, after having been saturated with ammoniacal gas, is treated with a current of sulphuretted hydrogen. The liquor now becomes of a deep dirty green color, and deposits a little sulphur. It is now left for twenty-four hours, during which time crystals of sulphur are deposited; the odor of sulphuretted hydrogen disappears, and is replaced by a strongly ammoniacal smell. If distilled now to recover the alcohol, a good deal of sulphur is deposited, and it is impossible to continue the distillation long, because of the violent bumping which ensues. It is therefore allowed to cool, and the sulphur is removed. On distilling the liquor again, more sulphur is deposited, which must also be removed. The process must be continued, resaturating the liquor with sulphuretted hydrogen if need be, until a heavy oily matter, (aniline) deposits, which must be separated from the liquor, and redistilled by itself. The aniline is thus obtained nearly pure.

Instead of using an alcoholic solution of nitrobenzole and treating it successively with ammonia and sulphuretted hydrogen, the alcholic solution of sulphide of ammonium may be prepared beforehand, and the nitrobenzole poured into it. A part is dissolved immediately, and the remainder by dryness in the course of the operation. It is sometimes advantageous, instead of waiting till the aniline separates, to add hydrochloric acid to the liquor in the retort, until it is slightly acid, and then to distil almost to dryness, by which means chloride of aniline is obtained. This is decomposed by an excess of caustic soda, and the aniline set at liberty is distilled off.

To avoid any danger from the bumping, a tinned copper still must be used, which should be heated by steam under a light pressure. At first, the temperature should not exceed 90° C.; but, after some time it may be raised to 100° or 110°.

The ammoniacal alcohol condensed in the worm, may be resaturated with sulpburetted hydrogen, and used over again with a new quantity of the nitrobenzole.

2. *Reduction of the nitrobenzole by nascent hydrogen.*—In preparing aniline by this process, the nitrobenzole and zinc are placed in a vessel, and dilute sulphuric or hydrochloric acid is added, so as to produce the disengagement of a small quantity of hydrogen. By degrees the nitrobenzole disappears, and aniline is formed, which remains in solution in the hydrochloric or sulphuric acid. To isolate it, an excess of caustic soda is added, and the mixture is distilled, on which the aniline passes over with the vapor of water.

Bechamp first recommended the employment of acetic acid and iron filings. He places in a retort one part of nitrobenzole, one and a half parts of iron filings, and one part of concentrated acetic acid. The reaction takes place without the application of external heat, the mixture becoming hot by itself, and the vapor being condensed in a receiver, which must be kept well cooled. The condensed products consist of aniline, acetate of anline, and some unchanged nitrobenzole. These are allowed to cool, and are then returned to the retort, and again distilled to dryness. The distillate is now treated with potassa fusa, and the aniline separates as an oily layer, which must be removed and distilled once more.

The residue of the mixture of iron filings, acetic acid and nitrobenzole, which remains in the retort after the distillation, still contains a considerable amount of aniline. To obtain this, the retort must be washed out with water acidulated with sulphuric or hydrochloric acid, and the solution filtered, and then evaporated to dryness. The dry residue is then mixed with quick-lime, and placed in a retort of iron or refractory ware, and distilled; and the aniline thus obtained must be rectified.

3. *Reduction of Nitrobenzole by Ferrous Acetate.*—Ferrous acetate reacts on nitrobenzole, and converts it into aniline, while the sulphate, chloride, and oxalate of iron have no action on it. The reaction is represented by the formula—

$$C_{12}H_5NO_4 + 12FeO + 2HO + \overline{A} = 3Fe_2O_3 + C_{12}H_7N + \overline{A}$$

One part of nitrobenzole is placed in a retort with an aqueous solution of acetate of iron. The retort is then heated over a water-bath for several hours, and then the contents are filtered—being diluted with water if they have become pasty. The residue left on the filter, which is principally hydrated peroxyde of iron, is washed with boiling water. The filtrate and washings are then distilled, the condensed products being water, acetic acid, and acetate of aniline. These may be again distilled with strong sulphuric acid, (using four-tenths of the weight nitrobenzole employed) to recover the acetic acid, and form sulphate of aniline, and the latter may be decomposed by caustic potash, and the aniline distilled off. This process has not been found advantageous, and has consequently been given up.

4. *Reduction of Nitrobenzole by means of Arsenite of Potash or Soda.*—This process was invented by Wohler. He digested nitrobenzole with a solution of arsenious acid in a strong ley of caustic soda, or placed the arsenical solution in a tubulated retort, heated it to the boiling point, and then allowed the nitrobenzole to fall in drop by drop. Under these circumstances, nitrobenzole is transformed into aniline, which distils over, and it is only necessary to saturate with an alcoholic solution of oxalic acid to obtain perfectly pure oxalate of aniline.

The last method of forming aniline we shall quote, is that of Schlagdenhausen, who has shown that it is produced when nitrobenzole and sulphide of carbon are heated together in a sealed tube to 160°.

*Properties of Aniline.**—Aniline when pure, is a colorless liquid, very astringent, having an aromatic odor, and an acrid burning taste. It is slightly soluble in water, and very soluble in alcohol and ether. Its sp. gr. = 1·028; at — 20°, it does not freeze. It boils at 182°, and distils unchanged. When warmed, it dissolves sulphur and phosphorus. It is a powerful base, combining with acids to form salts, which in general are soluble. It decomposes ferrous and ferric salts, and the salts of zinc, and alumina, precipitating from them the metallic oxydes. It also precipitates the chlorides of mercury, platinum, gold, and palladium; but it does not precipitate the nitrates of mercury and silver.

Aniline easily oxydizes, turning yellow in water, and in time becoming resinified.

When aniline dissolved in hydrochloric acid is acted on by chlorine, the solution takes a violet color; and, on continuing the current of chlorine, the liquid becomes turbid, and deposits a brown-colored resinoid mass. On submitting the whole to distillation, vapors of trichloraniline and trichlorophenic acid pass over.

A solution of the alkaline hypochlorites colors aniline a violet blue, which passes rapidly to a pale red, especially in contact with acids.

A mixture of hydrochloric acid and chlorate of potash acts on aniline, the final result of the action being chloranile $C_{12}Cl_4O_4$, but in the course of the reaction, several colored intermediary bodies are formed.

If a solution of chlorate of potash in hydrochloric acid, be added to a solution of a salt of aniline mixed with an equal volume of alcohol, and care is taken to avoid an excess of the hydrochloric solution, a flocculent precipitate is deposited after a time, of a beautiful indigo blue; this precipitate, filtered and washed with alcohol, contracts strongly, and the blue color passes to a deep green. The filtered liquid has a brownish-red color; on boiling it, adding fresh quantities of hydrochloric acid and chlorate of potash, a yellow liquor is obtained, which deposits crystalized scales of chloranile.

* Gerhardt, *Chimie Organ*, iii. p. 84.

An aqueous solution of chromic acid gives, with solutions of aniline, a green blue, or black precipitate, according to the concentration of the liquors.

When a small quantity of an aniline salt is mixed in a porcelain dish with a few drops of strong sulphuric acid, and a drop of a solution of bichromate of potash is allowed to fall on the mixture, a beautiful blue color appears after some minutes, which, however, soon disappears.

Dilute nitric acid combines with aniline without altering it immediately; but, after some time, nitrate of aniline crystallizes in the form of concentric needles, the mother liquor turns red colored, and the sides of the capsule become covered with a beautiful blue efflorescence. When a few drops of strong fuming nitric acid are poured upon aniline, it is immediately colored a deep blue; on applying heat, the blue tint quickly passes to yellow, a lively reaction is manifested, which results in the formation of picric or trinitrophenisic acid.

Potassium dissolves in aniline, disengaging hydrogen, whilst the whole becomes a violet-colored pap.

The other reactions of aniline, which are characterized by the formation of anileine, fuschine, azaleine, will be related in a future number, when describing the processes for the preparation of these substances. But, before commencing these, we may just glance at some of the properties and derivatives of binitrobenzole.

Binitrobenzole, as before stated, is formed when nitrobenzole is added drop by drop to a mixture of equal parts of fuming nitric acid and sulphuric acid, as long as the liquids will mix. If such a mixture be boiled for a few minutes, it becomes on cooling a thick magma of binitrobenzole, which is easily purified by repeated washings with water. A single crystalization from alcohol, will furnish the body in long brilliant prisms, which melt at a temperature above 100°, and crystalize again on cooling in a radiated mass.

Binitrobenzole is very soluble in warm alcohol. When a plate of zinc well cleaned, is placed in a cold alcoholic solution of binitrobenzole, and hydrochloric acid is added by degrees, we observe that the disengagement of hydrogen, which at first takes place, soon ceases, and at the same time the liquid gradually takes a crimson red tint.† The reaction being completed, the excess of zinc is removed, and the liquor is saturated by an alkali, which precipitates the oxide of zinc, colored a deep purple. The precipitate is collected on a filter, and washed with alcohol. By distilling the highly colored alcoholic washings, washing the residue with cold water, then redissolving it in alcohol, and evaporating it afresh to dryness, the new matter is obtained perfectly pure. The authors have given it the name of nitrosophenyline. It has the formula C_{12} H_6 N_2 O_2. When obtained as above, it is a black shining substance; when heated, it fuses and decomposes directly; it is almost insoluble in water, but freely soluble in alcohol and acids An alcoholic solution containing only 0 2 per cent, is so deeply colored that by reflected light the solution seems opaque and of an orange red.

Concentrated hydrochloric acid and dilute sulphuric and nitric acids form magnificent crimson red solutions with nitrosophenyline, which is precipitated from them again, unchanged by alkalies.

Binitrobenzole, treated with an alcoholic solution of sulphide of ammonium, is at first converted into nitraniline—

$$C_{12}\,H_6\,(N\,O)_4\,N = C_{12}\,H_8\,N_2\,O_4$$

that is to say, aniline, in which one equivalent of hydrogen is replaced by one of nitrous vapor. Nitraniline crystalizes in yellow needles which stain the epidermis like picric acid.

ANILINE BLUE.

By M. Kœchlin.

If hypochlorite of lime be added to a solution of aniline, in a strong acid, with the acid in excess, and the acid is afterwards neutralized with an alkali, a blue color is produced.

Chromic acid, added to a solution of aniline in hydrochloric acid, gives a red, a violet, or a blue, according to the proportion of the acid. Thus:

1 lit. anil	× 0·5	lit. hyd. ac.	× 80	grm. chro.	gives	reddish.
1 "	× 0·75	"	× 80	"	"	"
1 "	× 1·0	"	× 80	"	"	violet.
1 "	× 1·5	"	× 80	"	"	blue.
1 "	× 2·0	"	× 80	"	"	"

If the last two mixtures be neutralized with lime, solutions with an alkaline reaction are formed

When protected from the air, the blue color changes to a greenish tint; but the blue is restored on exposure. It is reddened by an acid. In these two characters, it resembles litmus.

ON THE COLORED DERIVATIVES OF ANILINE.

By M. E. Wilm.

The present communication is intended to give some information relative to the composition and constitution of the aniline violet, now so extensively used in the arts. Nothing will be said of the mode of application, since it is well known that this, as well as the other colored derivatives, combines directly with wool and silk, but in the case of cotton requires the mediation of some organic mordant, such as albumen.

† Church and Perkin, *Quart. Journ. Ch.*, Sec. ix. p. 1.

The specimen of violet aniline or *anileine* I have analyzed, was prepared by M. Kœchlin of Mulhouse, who placed it at my disposal. It had been brought to a tolerable degree of purity, but nevertheless contained some resinous and mineral matters. These were removed by dissolving it first in weak alcohol, and then repeatedly in absolute alcohol. After this treatment, it left no residue on incineration.

The following are the figures obtained in four analyses:

1. 0·2497 grm. gave 0·695 carbonic acid, and 0 1355 of water.
2. 0·2695 " 0·734 " 0 140 "
3. 0·311 " 0·850 " 0·164 "
4. 0·3575 " after combustion with soda-lime gave 0·351 of platinum.

The percentage composition, calculated from the above results, is as follows:

	1.	2.	3.	4.	Mean.
Carbon	74·87	74·29	74·54	....	74·56
Hydrogen	5·94	5·77	5·86	....	5·86
Nitrogen	....	....	....	13·90	13·90
Oxygen	....	....	....	....	5·68

These numbers answer with sufficient exactness to the formula—

$$C_{18}H_{17}N_3O$$

which requires the following numbers:

Carbon	74·23
Hydrogen	5·86
Nitrogen	14·41
Oxygen	5·50

The body, therefore, will be the result of the action of 3 atoms (double) of oxygen, on 3 molecules of aniline, with the elimination of 2 molecules of water, according to the equation

$$3(C_6H_7N)+3O=2HO_2+C_{18}H_{17}N_3O.$$

The above experiments were made with two distinct products prepared by the same process. It remains to be seen whether products prepared by different processes would yield the same results. M. Scheurer Kestner, who has repeated my analyses, has found amounts of carbon and hydrogen agreeing exactly with my own, but he has found a smaller proportion of nitrogen. I do not know whether his preparation is the same as that of M. Kœchlin.

Aniline violet, when pure and dry, is of a beautiful green color, a good deal resembling murexide. It gives an intense color to water, although its solubility in that menstruum is very small. A very small quantity of carbonate of soda and some other salts, precipitate it entirely from its solution. The best solvents for aniline are alcohol, acetic acid, and glycerine. It is a very stable body, reducing agents having no action upon it. Oxydyzing agents modify it; but if the action has not been very energetic, the color reappears on the addition of sulphite of soda. When an acetic solution is treated with binoxyde of lead, anileine is destroyed, and a red solution is obtained, which perhaps contains rosolic acid, C_6H_6O.

The characteristic action of anileine is, its turning blue with concentrated hydrochloric and sulphuric acids; on the addition of a certain quantity of water, however, the violet color is reproduced. This test serves to distinguish it from the violet of archil, which, under the same circumstances, changes to red.

When hydrochlorate of aniline is treated with a small quantity of chlorate of potash, a green precipitate is produced, which remains suspended in a brown liquor. If the action is stopped when the precipitate is formed, the filtered liquor has one remarkable property: when a fabric or sheet of paper is impregnated with the liquor, and exposed to the action of the air at 40° or 50°, it soon takes a beautiful deep green shade. In this we have a phenomenon quite analogous to that of the oxidation of white indigo, only the action of the air is slower. By continuing the action of the chlorate of potash longer, the violet of aniline is produced, and at last chloranile, or perchlorated quinone.

When aniline is treated with chlorine, the violet is also obtained, but the production is not immediate; the aniline first becomes of an intense blue, and if the operation be conducted in the presence of air, the part of the liquid exposed to the action of oxygen is colored a deep green, a similar phenomenon to that quoted above.

I shall conclude with a few words on the red derivatives of aniline, fuchsine, and azaline. The history of these bodies is very obscure: the first is produced by the action of anhydrous metallic chlorides on aniline; the second under the influence of nitrates, and also of nitric acid. It is clear that fuschine cannot contain oxygen; it is no doubt a particular base, combined with hydrochloric acid, for all the chlorine it contains is precipitable by nitrate of silver.

The following are some determinations of the carbon and hydrogen.

	1.	2	3.	4.	5.
Carbon	69·63	69·54	69.16	68·84	69 00
Hydrogen	5·86	6 72	6 01	5·99	5·75

From such results it is impossible to draw any conclusion relative to the composition of fuschine. The amount of chlorine is 9·50 per cent, when the determination has been made with lime, or directly with nitrate of silver.

The nitrogen cannot be accurately estimated by a combustion with soda-lime, for a certain quantity of aniline, is always obtained, which forms a stable chloroplatinate. The amount of this element is about 10 per cent, but the results are always very discordant. The azaleine prepared by M. Gerber of Mulhouse, differs from fuschine, first in the mode of preparation, and then in not containing chlorine, but nitric acid. It is very probable that these two bodies are the chloride and nitrate of the same base.

ON THE PRESENCE OF CHLORINE IN COAL.

By Mr. Thomas J. Leadbetter, Glasgow.

(From the *Chemical News.*)

No attempt has been made, so far as I am aware, to ascertain the quantity of chlorine in coal. The presence of chloride of ammonium among the products of the destructive distillation of coal, has been noticed by Fownes and others; and it has also been observed that when the ammoniacal liquor of gas-works is concentrated by evaporation, crystals of that salt are deposited. Manufacturers of sulphate of ammonia have likewise found that a notable quantity of combined ammonia remains in the still after the carbonate of ammonia has been distilled off. In a particular sample of this residual liquor from the still, I found 506·4 grains of chlorine per gallon; and in two samples of undistilled ammoniacal liquor, I found respectively 156 and 76·4 grains per gallon.

The existence of so large a quantity of chlorine in this ammonical liquor, suggested to me that it would be interesting to ascertain the proportion of chlorine in coal, and for this purpose I undertook a series of experiments with various samples of cannel and other coals obtained from different localities of Scotland. One thousand grains of each sample were boiled in distilled water, and the insoluble portion being filtered off, the chlorine was estimated in the filtrate, by nitrate of silver in the usual way. The following table shows the results obtained, with the calculations to a ton:

Name of Coal.	Cl. P. C.	Cl. per Ton.
Lasmahagow	·015292	2383
Boghead	·012369	2939
Bank Coal	·017300	2712
Knightswood	·019791	3103
Barton's Holm	·009277	1454
Monkland	·027831	4363
Thankerton	·004948	775
Soft Coal	·004948	775

It appeared also desirable to test the ash of the above coals for chlorine, and with this view a known weight of the coal was first coked and afterwards ashed in a platinum crucible, and the ash being boiled in water was tested in the usual way for chlorine. In the ash from several of the samples not a trace of chlorine was detected, and in the others only a minute and inappreciable quantity was found. It is therefore evident that when coal is distilled or carbonized in close vessels, the chlorine is expelled with the volatile matters, and this fact affords a satisfactory explanation of the circumstance that no mention is made of the presence of chlorine in the various analyses of the ash of coal published in different chemical works.

In another set of experiments with the same coals, I distilled a portion of each in an iron tube, and carefully tested the distillate for chlorine. In every case I found conclusive evidence of the presence of an appreciable amount of chlorine.

Laboratory, Andersonian University, Glasgow, 1860.

WATER SUPPLY IN ANCIENT ROME.

In ancient Rome there was nothing regarded as so indispensable, or as blending the useful and agreeable, so much as public fountains and private baths. They were deemed not only luxuries, but became to a large portion of the inhabitants almost necessaries, for every garden had its fountain, and almost every house its bath. The art of conducting water from different sources to their cities (but principally Rome), and the distribution made of this necessary of life among the citizens, was esteemed by the leading men and chief magistrates of sufficient importance to deserve every attention. Rome was furnished with water, from ten principal aqueducts, at the rate of nearly three hundred million of gallons daily: it was conveyed to large covered reservoirs, whence it was distributed by subterraneous tubes to fountains in different parts of the city, and from thence it was conducted to their houses and gardens. These fountains were among the principal ornaments of the city, being accompanied with statues of marble and bronze. All these works were maintained with the greatest order and discipline, which, requiring great authority, the Consuls, and even the Emperors themselves, made it a part of their immediate duty, regarding the supplying of the city with water as a thing of the first importance. The Consuls had, for a long time, the superintendance of the aqueducts, but afterwards this part of their duty was consigned to the Ediles, until the time of Augustus, who, to recompense Marcus Agrippa for the extraordinary pains he had been at during his Edileship—who had caused to be made seven hundred reservoirs, one hundred and thirty chateaux d'eau, and one hundred and fifty pumps—magnificently decorated, created him superintendent of the water works, and president of a company of 240 officers and commissioners. There was afterwards another company established, consisting of 460 persons, both of which companies were divided into different departments, whose exclusive employment was the conducting and distributing water through the city. The expense of those water works, as may well be imagined, was immense: it amounted to upwards of one million three hundred thousand dollars annually, including the salaries of the officers, and the repairs of the aqueducts, basins, fountains, &c. Each citizen paid in proportion to the quantity of water he was supplied with, and even this sum was for many years inadequate to the purpose; an extraordinary tax therefore sometimes became necessary.

COAL-OIL AND ITS MANUFACTURES.

A late number of the *World* says:

Like most of the useful inventions and discoveries of the present day, the extraction of a cheap and safe illuminator from coal and other bituminous substances, has attained its present development, through the long and patient labors of the chemists of this country and of Europe. The abundance of the raw materials, cannel coal, bitumen and petroleum in the United States, naturally caused a greater expenditure of skill and capital here than in any other country. In 1853 the manufacture was first commenced in America by a New York company, working under the "Kerosene" patents which were granted to a chemist of this city.

In 1855, after the new oil had in some degree overcome the prejudices of the people and the opposition of those interested in the manufacture of camphene and burning fluid, the owners of deposits of cannel coal, which is found in many parts of the Alleghany coal field, began to erect works for its manufacture. The raw material up to that time had been imported from the British provinces and Scotland. In most cases the business proved unremunerative from the fact that the art was a new one, and the data for its successful prosecution were only to be obtained by experience. The mystery which was about the art served to excite the desire of many persons to attempt its prosecution, and with every accession to the ranks of coal-oil amateurs, the statements made of the astonishing results of their experiments only intensified the excitement upon the subject. The yield of marketable oil from one ton of cannel coal, averaging 20 gallons in the Western coal fields, was stated to be 100 gallons and 150 gallons, and the profits of the business were calculated from that enormous yield, far beyond that of the purest bitumen, which yields rarely more than 75 gallons per ton. A coal-oil fever, which has been compared to the "morus multicaulis" mania, seemed to fasten upon all who attempted to experiment in making oil. Materials for some very laughable farces abound in the experiences of the pioneer coal-oil manufacturers. In the log cabins of the mining districts of Ohio, Pennsylvania, Kentucky and Virginia, some extraordinary experiments were undertaken by persons whose desire to learn all about the art was at that time only equalled by their ignorance of chemical manipulations. The process of distillation would be occasionally directed by the village apothecary, under the superintendence of the coal land-owner, both in turn overlooked by the capitalist of the county, who varied his scientific labors by demolishing the statements and calculations of his companions. Frequently the glass retorts used would burst from being overcharged, and sprinkle the party with creosote and carbonic acid, which is found in the crude oil distilled from coal. In one mining district where the writer was employed in building a coal-oil distillery, the people planted corn in great quantities, under the impression that it would bring a great price at the works; they not believing that oil could be made from "stone coal," as they called it, but supposing that the statement was made to prevent their ministers from denouncing the concern as a whiskey distillery.

Although the first coal-oils manufactured were inferior to those of the present time, they soon came into use for burning and lubrication, principally for the former purpose, however. The following list comprises most of the companies and firms manufacturing coal-oil, not more than ten of which were in operation prior to 1856:

COAL-OIL COMPANIES AND FIRMS, IN 1860.

Aladdin Co., Kiskiminitas, Pa.; Atlantic Co., New York; Adair & Veeder, Pittsburg, Pa.; Anderson, Darlington, Pa.; Breckenridge Co., Cloverport Ky.; Boston & Portland Co., Boston; Belloni & Co., New York; Brooks, Zanesville, O.; Covington Co., Covington, Ky.; Cox, Zanesville, O.; Carbon Co., New York; Cornell & Co., Canfield, O.; Clough & Co., New York; Downer Co., Boston; Dean, Cleveland; Empire State Co., New York; Excelsior Co, New York; Eureka Co., New York; East Cambridge Co., East Cambridge, Mass.; Enon Valley Co., Enon Valley, Pa.; Franklin Co., New York; Forest Hill Co., Kanawha, Va.; Falling Rock Co., Kanawha, Va; Great Western Co., Newark, O.; Greers, Kanawha, Va.; Great Kanawha Co., Kanawha, Va.; Grasselli, Cincinnati; Glendon Co., Boston; Hartford Co., Hartford, Ct.; Himebaugh & Co,, Cochocton, O.; Knickerbocker Co., New York; Kerosene Co., New York; Keystone Co., Preston co., Va.; Long Island Co., New York; Lucesco Co., Kiskiminitas, Pa.; Marion Co., Taylor co., Va.; North American Co., Kiskiminitas, Pa.; N. Y. & Wheeling Co., Wheeling, Va.; New Bedford Co., New Bedford, Mass.; N. Y. Coal Oil Co. New Gallilee, Pa.; Orion Co., N. Y.; Pinkham, Boston; Peasley, Boston; Page & Co., Boston; Pictou Co., New York; Palestine Co., Palestine, Pa.; Phœnix Co., Cincinnati, O.; Preston Co., Preston co., Va.; Robinson & Co., Perry co., O.; Ritchie Co. (bitumen), Ritchie co., Va.; Sherwood, Canfield, O.; Staunton, Kanawha, Va.; Stamford Co., Stamford, Ct.; Union Co., Maysville, Ky; White Day Co., Monongahelia co., Va.; Western Co., Cincinnati, O.; Zephyr Co., New York. Total 57.

There are, besides the above, a number of small coal oil works in Philadelphia, Baltimore, and the western cities, owned by individuals.

The quantity of coal-oil produced is estimated to be thirty thousand gallons per day, or nine million gallons per year. Competition having reduced the price from $1 25 per gallon to 70 cents per gallon, many of the works mentioned above have been closed, but the supply has been more than sustained by the petroleum wells, whose products have been put into market with great rapidity. The capital already expended in coal-oil works and cannel coal mines, is estimated at nearly $4 000 000. Three of the largest companies have expended fully $1.000,000 in the seaboard States and $750,000 has been invested in the Kanawha valley alone. Paraffine, a beautiful, wax-like product, incidental to the manufacture of coal-oil, is now made into candles by two companies in this city, and will most probably become a regular article of commerce.

The manufacture of coal-oil lamps, a branch of the lamp trade which has resulted from the use of the oil, forms the greater part of the business of sixteen manufacturing companies, who employ

600 men in making burners,
600 men in making brass work in stands,
250 men in making marble vases,
700 men in making glass bowls, shades, &c.,
200 women and boys in making paper shades,
200 women and boys in making brushes,

and furnish work for 125 looms in making coal oil lampwick.

The lamps are sold from $3 50 per dozen to $96 per dozen; the greater part are disposed of at $7 to $8 per dozen.

The designs for paper and glass shades and fountains are as numerous as those of the lamps, which number 250 varieties in the classes of stand, bracket, hanging and side lamps. The style of these lamps has been much improved lately, and they now are as well made, and as rich and beautiful in appearance, as most of the candelabra imported from abroad.

The following Proclamation is from the pen of Mr. J. R. Thomas, the engineer of the Williamsburgh, N. Y., gas-works. It is not bad to take, after dinner:

GAS! GAS!! GAS!!!

Whereas, The Common Council have granted to the Williamsburgh Gas-Light Company a new contract to furnish the city with gas for the public lamps at a price almost equal to the first cost of gas. And

Whereas, Monopolies are dangerous, and only to be tolerated on condition that they should be compelled to carry on their operations entirely for the benefit of the public, without any regard for themselves. Be it therefore

Resolved, That the following contract, submitted by your very humble servants, be adopted in lieu of the one passed by the Common Council:

Art. 1st. That the Williamsburgh Gas-Light Company have the exclusive privilege of manufacturing illuminating gas.

Art. 2d. That they have the exclusive privilege of spending not less than fifty, nor more than one hundred and fifty thousand dollars, yearly.

Art. 3d. That they have the exclusive privilege of laying gas mains in all the lanes and alleys the undersigned Committee may direct.

Art. 4th. That gas shall be furnished for the public lamps at 15 dollars per annum, for 17 feet burners, and the same price for burners of a larger size; provided, however (and upon this the exclusive privilege depends), that the Company shall make a full, fair and impartial yearly statement of their operations, with the affidavits of the officers, stockholders, their wives, children, and all relatives of the first generation attached; and if, from the above statement, the deficit is not equal to 25 per cent., then the amount to make their losses net 25 per cent. shall be deducted from the public lamps.

Art. 5th. That the undersigned be a Committee to make all rules and regulations for the Williamsburgh Gas Co.; receive all moneys due the Co.; provided, however (and upon this the exclusive privilege depends), that the Co. have the privilege of paying all expenses and demands against them out of any moneys they have; also, that the Committee provide every gas consumer with a patent spring balance to weigh the gas, and if the specific gravity is below 999 9-10, to make whatever deduction we, in our wisdom, may see proper; to have the power to condemn any or all the apparatus the Company may have in use and order new at our pleasure—the salary of the Committee to be named by themselves; provided, however (and on this the exclusive privilege depends), that the Company have the right to pay them.

Art. 7th. That if the Company comply with the above requirements, the contract to remain in full force and virtue, and if they do not, the works, apparatus, street mains, &c., to be transferred to the Committee; provided, however (and upon this the exclusive privilege depends), that the Company enter into bonds indemnifying the Committee for any expenses they may be subject to for patent rights, wear and tear, &c., &c.

As the Committee have entered upon this subject entirely for the benefit of the public, and not for any sinister motive in the way of office, &c., and further knowing from our researches in chemistry, that we are more competent to perform these stipulations than any others to be had; and from the great results we have had in the distillation of one cord of pine wood, viz., volatile matter 86976 cubic feet, charcoal two scow loads (scows Spring st. size), specific gravity of the gas 1987 9-10, it will be evident to the unthinking that we are submitting a good contract for your approval.

Your distinguished friends,

JOHN JONES, late of the War Office.
JIMMY SMITH, Prof of Chem, State of L.I.
BILLY BROWN, Ex-Pound Keeper.

CAUTION TO GAS OFFICERS.

A person representing himself to be a brother of Mr. George W. Kraft, the gasometer builder of West Philadelphia, Pa., has been making the tour of the Union, not on his "muscle," exactly, but on the "sinews" of the purses, of the credulous friends of his alleged brother. This bogus fraternal, after visiting New Orleans, St. Louis Boston, &c., turned up in our sanctum one day last week, and finding himself *minus* enough to take him back home, "borrowed the loan" of a sum much more modest than he invested for our friends, McCullough of New Orleans, and Sabbaton of the Manhattan. He is a dark-complexioned Yankee of 25 to 30, has black hair and good teeth. The best thing about him, to our eye, was his familiarily with the contents of the JOURNAL. He had evidently been "reading up" preparatory to coming down upon us.

We are told that two other industrious fleas are nibbling at our advertisers in other cities for renewals of their orders and prompt payment of the bills. We hope somebody will squeeze them. We have no shadows.

A CURIOUS REMONSTRANCE AGAINST GAS.

The following document is worth preserving, and should be read with the Declaration of Indepence, every fourth of July, in every city and town in the Union. It will hardly be credited that it was signed by several hundred of the prominent citizens of Philadelphia, and among them was John C. Cresson, Esq., the present engineer-in-chief of the Philadelphia Gas-Works! The Philadelphia *Ledger* accounts for this upon the hypothesis that some of the petitioners owned city bonds, and fearing a depression in their value by an increase of the city debt, were thus actuated by personal motives in subscribing to the remonstrance. The reasons adduced against the use of gas are truly laughable, and afford a striking commentary on old fogyism. Without controversy, is not this illustration of the wisdom of so-called philosophers of the day, a practical rebuke to those wiseacres who are forever butting their heads against new improvements and discoveries? The italics and capitals are copied from the original:

PHILADELPHIA, Nov. 28, 1833,

To the Hon. the Select and Common Councils of the City of Philadelphia.

GENTLEMEN:—The subscribers beg leave respectfully to remonstrate against the plan now in agitation for LIGHTING THE CITY WITH GAS, as they consider it a most inexpedient, offensive and dangerous mode of lighting. In saying this, they are fully sustained in accounts of Explosions, Loss of Life, and a great destruction of property, where this mode of lighting has been adopted.

We consider GAS to be an article as IGNITABLE AS GUNPOWDER, and nearly as fatal in its effects; as regards the immense destruction of property, we believe the vast number of fires in New York and other cities, may be in a great measure ascribed to this mode of lighting; the leaking of pipes and carelessness of stopping off the Gas, furnish almost daily instances of its destructive effects. And when we consider that this POWERFUL AND DESTRUCTIVE AGENT must necessarily be often left to the care of youth, domestics, and careless people, we only wonder that the consequences have not been more APPALLING. It is also an uncertain light, sometimes suddenly disappearing, and leaving streets and houses in total darkness.

The *Waters of the Delaware and Schuylkill*, now considered the most pure and salubrious in the world, as many long voyages have fully tested, must soon, we fear, experience the deterioration which has reduced the WATER OF THE THAMES to the present impure and unhealthy state, for no reservoir will be able to contain the immense feted drains from such an establishment, and very soon the rivers must be their receptacle, to the destruction of the immense shoals of *Shad, Herring* and other fish with which they abound; the same cause must produce like effects. *Salmon, Smelts* and other fish, formerly caught in vast quantities in the Thames, have nearly all disappeared; the constant digging up of the streets, the circumstance that the gas-pipes which at the intersection of each square must come in contact with the water-pipes, are difficulties and evils which we would anxiously avoid.

In conclusion, we earnestly solicit that the lighting our *city with oil may be continued.*

And your petitioners, as in duty bound, will ever pray, &c.

SUPPLEMENTARY WATER TABLES.

The following tables are from Mr. Daniel Marsh's report to the Corporation of Rochester, N. Y., on the introduction of a supply of pure water into that city.

TABLE SHOWING THE QUALITY OF THE WATER USED FOR THE SUPPLY OF VARIOUS CITIES IN AMERICA AND EUROPE.

CITY.	Source of Supply; or, name of Water Works.	Persons making or reporting the Analyses.	No. grs. per gall.
London....	Thames.	Professor Brand.	18.
"	New River.	"	19.20
"	Average of total supply.	H. P. M. Birkenbine.	22.46
"	Well St. Paul's Churchy'd	Wm. J. McAlpine.	75.00
"	" Lambeth (shallow.)	"	100.10
Paris.....	River Seine.	Baldwin & Stevenson.	12.74
"	Artesian Well.	Wm. J. McAlpine.	9.86
Lyons.....	River Rhone.	Baldwin & Stevenson.	12.88
"	Lake Geneva.	"	10.64
New York..	Manhat'n Well (obsol'te.)	F. B. Tower.	125.00
"	Average of several wells.	"	38.00
"	Croton River at Dam.	"	4.99
"	Croton.	B. Silliman.	10.93
"	"	B. Silliman, Jr.	6.66
Philad'lphia	Schuylkill River.	Booth and Garrett.	6.10
"	"	Bayo.	4.42
"	"	B. Silliman.	5.50
"	"	F. B. Tower.	4.08
Boston.....	Cochituate Lake.	Wm. J. McAlpine.	1.85
	do.	H. P. M. Birkenbine.	3.37
	do. 62 feet deep	Wm. J. McAlpine.	3.57
	do.	Dr. Jackson.	5.00
	Well Beacon Hill	"	50.00
	Average three wells.	"	44.46
	Av'ge of Croton Analyses.		7.26
	" Schuylkill "		5.02
	" Cochituate "		3.45
Brooklyn...	Average several wells.	J. R. Chilton.	45.40
"	Long Island streams.	"	2.48
"	do. do do. 2d sample	"	23.67
Albany	Hudson River.	Dr. Emmons.	7.24
"	" "	"	6.32
"	Rensselaer Lake.	"	4.72
"	Well Capital Park.	"	65.52
"	Average several wells.	"	48.69
Cambridge.	Fresh Pond.	Baldwin & Stevenson.	6.32
Jersey City.	Passaic River.	"	7.44
Troy.....	Mohawk River.	"	7.88
"	Served by Water Works.	"	6.29
Hartford ...	Connecticut River.	M. C. Weld.	2.618
Cincinnati..	Ohio River.	J. M. Locke.	6.73
Detroit....	Supply from River.	Prof. Douglass.	5.72
"	Wells.	"	116.46
Indianapolis	Wells.	D. Marsh.	60.00
Montreal...	Ottawa and St. Lawrence.	T. C. Keifer.	7.04
Quebec....	St. Charles River.	H. P. M. Birkenbine.	8.10
Hamilton...	Grand River.	Samuel McElroy.	12.66
"	Burlington Bay.	"	8.44
Elmira.....	Carr's Creek.	D. Marsh	4.00

COST OF PUMPING WATER SUPPLIES.

LOCALITIES.	Daily Supply.	Annual Expense.	Cost per million gallons.
		$	$
Philadelphia, aggregate.....	19,638,442 g.	50,184	7 01
Fairmount, separately.....	9,288,415	5,803	1 71
Twenty-fourth Ward Works, sep.	727.277	7,762	29 23
Schuylkill, " "	7,243,114	25 104	9 49
Delaware, " "	2 379,635	11,515	13 26
Pittsburg.....	4,075,755	26,000	17 47
Hartford.....	185,338	5,000	17 44
Jersey City.....	2,000,000	10 000	13 69
Buffalo.....	3,000,000	19,000	17 35
Cleveland	1,000,000	7,712	21 13
Detroit.....	2,142,774	15,749	21 37
Chicago.....	3,000 000	25,011	22 88
Cincinnati.....	4 618,567	28,000	16 61
Cambridge.....	400,000	3,500	23 97
Aggregate.....	30,645,183	176,591	

$176,591÷ 30,645,183—5,762.

Average annual expense of 1,000,000 gallons daily, $5,762.

" daily " " " $15 78

The Fairmount Works are not included in the above aggregate, because they use water power, and the Twenty fourth Ward Works are omitted, because they are very unlike the other works included in the statement. The Fairmount Works are the only ones using water power from which complete returns have been received, and they exhibit a very favorable result as to the cost of pumping by water power.

Although the cost of pumping at the Schuylkill Works is the lowest, yet it may be more safe to take the average cost of pumping at all the works which use steam power, as an index of the expense of a supply of water for this city, on plans Nos. 1, 2 and 3; viz.: for 1,000,000 gallons daily, $15 78; and for 2,000,000 gallons, $31 50.

TABLE SHOWING THE RATIO OF THE INCOME OF WATER WORKS TO THE POPULATION OF THE VARIOUS CITIES SUPPLIED.

CITIES.	Population.	Receipts.	Rate per head.
		$	
Philadelphia.....	600 000	551,180	$91
New York.....	934,000	800,219	85
Boston.....	180,000	316,290	1 75
Albany.....	66,350	80,517	1 21
Hartford.....	50,000	26 000	5
Jersey City.....	30,000	65,000	2 16
Buffalo.....	81,541	50.000	61
Cleveland	43,555	13 980	32
Detroit.....	70,000	57,194	81
Chicago.....	115.338	102 709	89
Cincinnati.....	180 000	184,837	1 02
New Orleans..	160,000	140,000	87
Plymouth	4,500	3,700	82
Bridgeport.....	10,000	7,000	70
Malone.....	3,000	1 500	50
Watertown.....	6,000	3,500	58
	2 534,284	2,403,624	

2,403,624÷ 2,534,284—948.

Rochester 48,096 45,595 948

EUROPEAN AND AMERICAN COAL.

MEMORANDUM SHOWING THE QUALITY AND PRICE OF COAL UNDER DISTILLATION, WITH NUMBER OF QUALITY OF ILLUMINATING POWER, AND THE QUANTITY OF GAS GIVEN OFF WITH COKE AND TAR ON EACH TON OF COAL, BEFORE AND AFTER THE PRESSURE OF THE CONDENSER, PURIFIER, SCRUBBER AND GASOMETER HAD BEEN REMOVED BY THE IMPROVED APPARATUS, FOR EXHAUSTING AND FORCING THE GAS FROM THE RETORTS.

By SAMUEL NOWLAN, C. E., No. 47 Wall Street, New-York City.

The names of European and American Coal, of 2000 lbs. to the ton, with price of each, and where mixed coal has been used, with their price and average production.	Price ₩ Ton of 2000 lbs.	No. of Quality of Gas produced.	Specific Gravity of Gas, the atmospherical air being 1000.	The Gas equal to the amount of candles in a single jet 4 in. flame.	Measurement of Gas from a ton of distilled coal, before the pressure of the Gasometer has been removed.	Measurement of Gas from a ton of distilled coal after the pressure of the Gasometer has been removed.	Measurement of density, the pressure being on the Retort, of volume of illuminating light reflected from Photometer, in feet.	Amount of Coke produced from a ton of coal after distillation, while under pressure of the Gasometer, from Retort.	Amount of Coke produced from a ton of Coal after distillation, when the pressure of the Gasometer has been removed from Retort.	Measurement of density of volume of illuminating light reflected from a Photometer after the pressure of the Retorts has been removed.	Amount of Gas produced on the ton of coal in distilling the Gas and Coal Tar.	Amount of pounds of Tar produced from a ton of coal while distilled with the pressure on the Retort.	Amount of pounds of Tar produced from a ton of coal, after the pressure has been removed from the Retort while under distillation.	The amount of Gas increased by the Improved Apparatus for Exhausting the Gas from the Retorts.	The value of saving, in dollars, per ton, in extra Gas produced.
	$ Cts						Feet.	Lbs.	Lbs.	Feet.	Lbs.			Cu. ft.	$ Cts
Cannel Coal, Eng.....	13 00	3	.580	2,295	9,000	11,250	120	1,160	840	130	840	175	118	2,250	6 37
Bituminous Lump.....	11 00	5	.453	1,929	7,800	9,750	87	1,111	889	100	889	170	117	1,950	4 88
Anthracite, Eng.....	14 00	2	.539	2,441	9,500	11,875	125	1,200	800	135	800	180	120	2,235	5 58
Pennsylvania, Am.....	6 00	7	.862	1,777	6,500	8,125	75	1,100	900	85	900	150	100	1,625	4 06
Ormskirk & Wigan, Eng.....	11 00	5	.453	1,929	7,800	9,750	87	1,111	889	100	889	170	117	1,950	4 88
Wigan & Cardiff, Wales.....	11 00	5	.453	1,929	7,800	9,750	87	1,111	889	100	889	170	117	1,950	4 88
White Haven, A.....	10 50	6	.466	1,826	7,000	8,750	79	1,111	889	89	889	170	117	1,750	4 06
White Haven, B.....	11 50	5	.453	1,929	7,800	9,750	87	1,111	888	100	889	170	117	1,750	4 88
Mixed Wigan & Newcastle.....	13 50	3	.534	2,295	9,000	11,250	125	1,160	889	130	889	175	118	2,235	5 58
Mixed, 17s. 6d., 10s. 6d., 19s., Eng. price.....	15 25	1	.580	3,306	9,700	12,250	130	1,200	800	145	800	180	120	2,530	6 37
Brunswick Pit.....	12 50	4	.530	2,228	8,500	10,625	95	1,160	800	110	800	175	118	2,125	5 31
Mixed, 5s. 6d., 8s. 6d., 8s.....	10 00	6	.466	1,826	7,000	8,750	79	1,111	840	89	840	170	117	1,750	4 38
Mixed, 9s., 11s., 18s.....	12 25	4	.528	2,212	8,500	10,625	95	1,110	889	110	889	175	118	2,125	5 31
New Castle, A.....	14 00	2	.539	2,441	9,500	11,875	125	1,200	840	135	840	180	120	2,235	5 58
" B.....	15 00	1	.580	3,306	9,750	12,250	130	1,200	800	145	800	180	120	2,550	6 37
Cumberland Lump, Am.....	8 00	6	.448	1,483	7,000	8,750	79	1,111	800	89	800	170	117	1,750	4 38
Scranton, "	5 25	8	.424	1,234	6,400	7,250	72	1,100	900	82	900	150	100	825	2 06
Boston, "	5 25	8	.424	1,234	6,400	7,250	72	1,100	900	82	900	150	100	825	2 06
Red Ash, "	5 50	7	.428	1,562	6,500	8,125	75	1,100	800	85	800	150	100	1,625	4 06
White Ash, "	5 50	7	.428	1,562	6,500	8,125	75	1,100	800	85	800	150	100	1,625	4 09

WATER GAS.

FOR THE AMERICAN GAS-LIGHT JOURNAL.

To the Public.—The *Public Ledger*, of November 14th, contained an account of the successful application of a test made in the presence of the delegated representative of that journal, whereby the production of the gas made at the Girard House by Sanders' process, was demonstrated to be mainly due to the decomposition of water.

An examination of the city meters, and of the bills from the City Gas Office, made by the same parties and others, whose pursuits eminently qualified them for the duty, proved conclusively that no city gas had been used at the hotel, at least between the 1st and 14th insts., (as published in the AMERICAN GAS-LIGHT JOURNAL of 15th Nov.)

We now append a certificate of the trial made, as suggested by Mr. SEELY, in the following extract from his letter to the editor of the *Public Ledger:*

"Allow me, in conclusion, to repeat, that if there is "still lingering with any one a hope of any virtue in wa- "ter gas, the Keystone Company have it in their power "to confirm it or confound it forever, by such simple "tests as I have suggested, viz: the turning of stop- "cocks and watching a meter and burner for a few "minutes."

GIRARD HOUSE,
Philadelphia, November 13, 1860.

The undersigned were present this evening, at six o'clock, at the gas-works of this hotel, and witnessed the effect of turning the stop-cocks on the pipes conducting rosin and steam to the gas retorts.

The gas-metre showed the production of gas at that time from the retorts to be eight feet per minute, both rosin and vapor of water being supplied in conjunction. The rosin valves were first turned, and the flow of rosin stopped. Eight minutes elapsed, and the meter then indicated the production of gas from steam alone to be 7½ feet per minute. The steam-cocks were then turned, stopping the flow of steam, and the meter instantly ceased to register gas. After a short space, steam alone was again turned on to the retorts, and the production of gas recommenced at increased speed, but of low degree of illumination. The rosin valves were then turned on, and the manufacture of illuminating gas proceeded as at first.

THOMAS M. COLEMAN,
CYRUS S. HALDEMAN,

The time has now come for repairs of the water gas-works at the Girard House, necessitating the use there of the city coal gas while the workmen are so engaged. The Trustees of the city works and their agents have now to elect whether they will retrace their steps by re-storing the two city meters and the broken inlet, where-by three sections of the hotel have been by them illegally cut off from a supply of gas by the city, or whether they will continue to withhold facilities freely accorded else-where, and thus inflict darkness upon a large portion of the establishment.

HENRY C. CAREY
MARMADUKE MOORE,
A. HART,
Committee of the Keystone Gas Co.
Philadelphia, Nov. 17, 1860.

PETROLEUM OILS WANTED.

There is an enormous demand for Petroleum, and none in market. We have had several applications for it. Who has it, and why do not the fabulous yields of the many wells reported to be in operation find their way to this market? Let us hear on this subject.

NEW GAS-WORKS UNDER WAY.

Gas-works are in progress at the following places:

Brownsville. Pa.	Meriden, Ct.
Fairhaven, Ct.	Milton, Pa.
Gettysburg, Pa.	Quincy, Mass.
Hastings and Dobbs Ferry, N.Y.	Saugerties, N.Y.
Houston, Texas.	Weston, Mo.

We hear that the subject of an opposition company is agitated in Troy, N.Y., but those at all acquainted with the town know that such a project there would only result in loss to all concerned. This matter of competing gas companies is, as we have said before, too grave to be trifled with, and all that have been initiated thus far, have, with two exceptions, to speak poetically, fizzled out. That projected in Buffalo, N.Y., was the most ridiculously concocted affair of all, and a letter which we received on the subject from the master-spirit, would, if printed, be treasured up in the archives of the British Museum, as a specimen of literature and enterprise. We shall take up this subject in an early number, and show by figures and facts within our possession, that under ordinary circumstances, an opposition gas company must become a burthen upon the community and be paid for by it, in one way or the other, in the end.

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is specially devoted to

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities and to improve the system of SEWERAGE, VENTILATION, and DRAINAGE everywhere.

Incidentally with these results, the business of all Gas and Steam Fitters and Plumbers; the erection of Gas-Works and Water-Works; the consumption of Coals, the manufacture and consumption of Coal-Oils, the manufacture of Gas-Pipe, Water-Pipe, Steam-Pipe, &c. Fixtures, Gas-Meters, Water-Meters, Retorts of iron and clay, and their varied apparatus; of Drain Pipes, Ventilating, Heating and Dredging Machines will be increased immeasurably.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

New works are now springing up, however, every week, and they will continue to increase rapidly hereafter.

Advertisers of Gas and Coal Oil, Water, Steam, Sewerage and Ventilating apparatus, and of Iron and Brass manufactures, &c., will find the AMERICAN GAS-LIGHT JOURNAL the most desirable and efficient medium of any in the United States, going, as it does, direct to the parties interested in those subjects.

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THE
AMERICAN GAS-LIGHT JOURNAL.
PUBLISHED SEMI-MONTHLY.

SATURDAY, DECEMBER 1, 1860.

The Proprietor of the AMERICAN GAS-LIGHT JOURNAL has the pleasure to announce that the editorial department will be hereafter under the charge of Mr. C. ELTON BUCK, a young gentleman of some promise, whose scientific education has been directed by Professor JAMES C. BOOTH, author of Booth's Encyclopædia of Chemistry, and recently assistant of Dr. CAMPBELL MORFIT of this city. With this introduction, Mr. BUCK will proceed to speak for himself.

The present inability to produce gas entirely free from all injurious impurities is a subject of great importance to gas engineers, and affords an encouraging field for study and experiment, the results of which may be of vast utility to the consumer, as well as of pecuniary interest to the fortunate discoverer of the desired process. That gas can be produced absolutely pure, and uniformly of the highest degree of illuminating power, we believe to be only a question of time; for when we consider the spirit of enterprise characterizing the gas-engineering profession, and the scientific and economic interests involved in the question, to say nothing of the rapid strides with which chemistry is advancing, we can but believe that suggestions will occur to the reflecting minds of those engaged in inquiring into the subject, which will lead to ultimate success in achieving the coveted object.

Of all the impurities in gas which may be designated as injurious, none are so productive of hurtful results as the sulphur compounds, whether existing as sulphuretted-hydrogen, bi-sulphuret of carbon, or other combinations of sulphur, which occur in a greater or less quantity in all coal gas. Of these compounds, bi-sulphuret of carbon exists to the greatest extent, and most obstinately resists all means adopted to effect its absorption, generating, during its combustion, sulphurous—and ultimately sulphuric—acid, the pernicious effect of which compound is in course of time very apparent. Dr. LETHEBY in his reports to the Corporation of London, states that owing to the noxious influence of this subtle impurity, the books in every library in England where gas is used are falling to pieces; and instances particularly the libraries of the London Institution, the Royal College of Surgeons, the Athenæum club-house, and the Literary Society at Newcastle-upon-Tyne, as examples of the mischief done.

Since the injurious effect of the sulphur compounds in gas was first observed, much attention has been drawn to the subject of removing it, and many plans have been devised, and patents taken out, particularly in England, for accomplishing the purpose; but a simple test will reveal the fact that, notwithstanding all these efforts, sulphuric acid is still generated during the combustion of gas, and an effectual process for its entire expulsion is yet to be described.

In a recent number of the London *Chemical News*, the Rev. W. R. BOWDITCH communicates a method of removing bi-sulphuret of carbon from coal gas, which, if proved by a practical test on a working scale, may be of great value to our gas companies. After some preliminary observations, the writer remarks:—"* * * The only possible way to remove the evils complained of is that of better purification: in the words of Dr. LETHEBY, 'the supply of gas freer from ammonia and sulphur compounds.' The removal of ammonia is a simple matter, for common clay not only removes every trace without injury to the light-giving materials of gas, but by the abstraction of compounds which tend to lessen the illuminating power of gas, it indirectly increases the illuminating power. There is therefore no necessity for the 'moisture in the earth to be converted into an acrid alkaline fluid.'

"The removal of bisulphuret of carbon, according to Mr. SPENCER, or, according to the far more accurate expression of Dr. LETHEBY, 'sulphur compounds,' in the plural, is regarded as a chemical desideratum. Dr. FRANKLAND, in his article on coal gas in Ure's Dictionary, says of bi-sulphuret of carbon, 'its presence in coal gas is very injurious, and as there are no known means of removing it on a large scale by any mode of purification, its non-generation in the process of gas-making becomes a problem of great importance.'

"Is it quite fair to reproach gas companies with the presence of bi-sulphuret of carbon in gas, when 'there are no known means of removing it on the large scale'? Would it not be fairer to offer a remedy for the evil, and to complain if the remedy were neglected? If Dr. FRANKLAND be correct in his statement, made in March last, the gas companies are blameless.

"I have now the pleasure of offering a complete remedy for the evils deplored. Not only can bi-sulphuret of carbon be removed, but by the same process gas can be freed from the sulphur of the sulphuretted hydro-carbons which always contaminate it.

"If slaked lime be heated in a tube to 500 F. and purified gas, quite free from sulphuretted hydrogen, be passed through the lime and over lead paper, the latter will be blackened. Of course the rapidity of the coloration will depend upon the amount of sulphur in the gas thus treated. The sulphur of the bi-sulphuret of carbon, and of the sulphuretted hydro-carbons, has been transferred to hydrogen and no difficulty exists in removing the sulphuretted hydrogen thus produced. I have tested the gas of sufficient gas companies by this process, to justify the conclusion that all gas contains the compounds in question, and that they may thus be removed from gas in general. A current of hydrogen sent through a flask containing some bi-sulphuret of carbon and over hot lime, in like manner blackens lead paper.

"As some of your readers may be disposed to try experiments on the gas with which they are supplied, I will point out one or two precautions of which the observance will save them much trouble. The slaked lime should be sifted through a piece of wire gauze, about 25 meshes to the square inch, and the coarser parts used. This facilitates the passage of the gas. The lime should be dried on the sand-bath, and when heated in the tube on the sand-bath, be blown through with a pair of bellows to remove superfluous water. This prevents cracking the tubes. All the lime in the tube should be kept at the same temperature. I secure this by perforating a piece of quarter-inch brass pipe with holes for about ten inches of its length, to use as a burner in a small furnace, and having my lime in the glass tube of the same length. The heat damages the perforated corks, and the lime is consequently kept about 3 inches from the end of each tube. I would strongly advise the observance of these precautions as saving labor. Should a fuller description of the apparatus be desired, I shall have pleasure in furnishing it.

"For the glass tube of these experiments, substitute gas-works purifiers, and the unsolved problem receives its solution."

From the above extract it will be seen that the plan proposed by Mr. BOWDITCH, though presenting some novel features, is not entirely new—the use of lime at a *red* heat having been proposed some years ago. The process above described has the advantage, however, of requiring a temperature some 700° less than dull redness, which is much more easily managed, and free from danger of explosions from carelessness of workmen or otherwise. We have not heard whether this process has been tried on a working scale. Such alone would be a true test of its value; for we have seen experiments conducted in analytical laboratories, with delicate manipulation, and pure re-agents, to the perfect satisfaction of the operator, which, when performed on a large scale, by unskillful laborers, using commercial drugs, by no means constituted a success.

We consider the purification of illuminating gas from sulphur compounds of such paramount importance, that we intend to lay before our readers any information touching the subject that may come under our notice, in the hope that the ideas thus thrown out may assist in suggesting a remedy for the evil. We will be pleased to receive communications from gas-engineers and others in regard to the matter, and hope that ere long it will be our pleasant duty to chronicle the fact that gas may be freely used in picture galleries, libraries, &c., without any apprehension from the destructive nature of sulphur compounds.

Our attention has been drawn to this subject by the letter of Mr. ROOME on page 137 of the JOURNAL, giving the results of the experiments ascertaining the comparative amount of bi-sulphuret of carbon in the London and Manhattan gas. The data there given were obtained by Mr. CARL SCHULTZ, the talented assistant of our excellent friend Dr. TORREY, the chemist of the Manhattan Gas-Light Company, under whose advisement the experiments were conducted. It is a matter of congratulation that the gas produced by the Manhattan Company compares so favorably with the London gas; and we hope, as we have intimated above, that we will soon have the satisfaction of announcing its entire freedom from all injurious impurities.

ABOLISHMENT OF THE RENT OF GAS-METERS.

From and after February 1, 1861, no rent will be charged for the use of gas-meters by the Manhattan, New York, or Harlem, N. Y., Gas-Light Companies.

SPRINGFIELD, MASS.—Originally rosin works; changed to coal in 1850. Run eight benches of three retorts each—iron; use Newcastle and Cannel coal mixed; make 4½ feet gas to the lb., and sold over 4 feet. Made, in 1859, over 8,000,000 cubic feet; have eight miles two to six inch mains. We received a slight-unsally savage letter from an anonymous source at Springfield, Mass., charging this company with misrepresentation in their report to us; but on calling upon the company for an explanation, it turned out that the writer had mistaken the figures of the Springfield, Ill., Company in our tables for the Massachusetts Company. The reports of both Companies are doubtless correct. The moral remains, that complainants, especially those afraid to give their names, should follow the advice of Davy Crockett, "Be sure you'r right—then go ahead!"

THE RIGHTS OF GAS CONSUMERS.

A correspondent inquires, "What are, precisely, my rights over the gas-meter and pipes in my house? How often am I bound to admit the gas officer to inspect them, and is the right of visit inherent to these monopolies?" We answer: The gas company own the service-pipe the length of three feet from the main; from that point to the house the pipe belongs to you. The company also own the meter. The pipe leading from the meter to the house-fittings is yours, and is under your exclusive control. The company are bound to furnish gas to you as long as you pay for it, and, if required, give security. The company are not bound to leave the meter in your house if you do not use their gas, though as a matter of courtesy, it is usually done upon request. The "right of visit," as you call it, is conferred by law upon the gas companies "at all reasonable times, upon exhibiting a written authority" from the company. (we will publish the whole law very soon) for the purpose of inspecting the meters and connections; and if you had seen as many instances of fraud upon companies as we have, you would realize the propriety of this law.

You have no right to disturb the meter or interfere with it in any manner. These are your rights and your obligations, and a sensible and judicious gas officer will, on his part, conciliate and bear with his customers, even if they are unreasonable, so that they will not feel aggrieved by their visits.

The London American.—We have been favored with several numbers of an ably edited and well printed weekly, bearing the above title, and published in London. We regard this enterprise as destined to be a success, financially and commercially, and if the editor will permit us to throw out a suggestion, it is that he keep his English readers posted up on the geography of this country, for when we last heard from them they were lamentably ignorant on that point, as well as on nearly every other connected with us. One prominent manufacturing house in England wrote us the other day, asking us to speak to the engineer of the Melbourne, Australia, gas-works—a little affair of some 16,000 miles distance, only—about a certain matter. The London *Era* said the Benicia Boy was born in Benecia, in the Troy district of the United States; and a noble friend of ours, in alluding to the Albany *Evening Journal*, spoke of its being published in the frontier town of the State of New York, though this was explained by his having a map of the State, published in 1802, hanging in his library. A little American geography wont hurt the best educated Englishman, so give them a chapter or two now and then, friend L. A.

PERSONAL.

We have been favored since our last issue with a visit from Mr. Wethered, of the well known firm of Wethered & Tiffany of San Francisco, Cal. After finishing the gas works at Honolulu, Sandwich Islands, these gentlemen commenced others at Los Angelos and Petulama, Cal., which are now progressing rapidly to completion.

Mr. William Gardiner, late engineer of the Portland, Oregon, gas-works, called last week with a photographic view of those works, presented to us by Messrs. Leonard & Green, the builders and proprietors. Mr. Gardiner bears a strong testimonial from his late employers, and will be a valuable acquisition to any works desiring his services.

Mr. Serrell of Columbus, Geo., visited us lately in reference to new water works which he is about building in that city.

BUSINESS DEPARTMENT.

Messrs. Fellows, Hoffman & Co. advertise their stock of gas fixtures, manufactured at their extensive works, comprising a full square, at Brooklyn, N. Y.

Messrs. Miller & Coates importers of drain pipes, Garnkirk chimney tops, &c., advertise their goods in the appropriate columns.

Messrs. Hunter, Keller & Co.'s new hot water gas-stove, or gas-heating apparatus, will be noticed by a neat illustration of it. It appears to possess all the advantages of the larger heating apparatus, but at a cost of only $25.

Mr. Pritchard, late foreman of Mr. Samuel Down, seeks a capitalist to join with him in the manufacture of gas-meters.

Mr. Morgan L. Curtis, another extensive manufacturer of gas fixtures, takes his place on our first page, which appears to be rapidly filling up with this prosperous department of mechanics. We are told that large orders continue to come in from the South for all descriptions of gas and water apparatus, and that remittances for accounts matured, are made with the usual punctuality and integrity that has always characterized that section of the country.

The card of the Brooklyn, N. Y., (regular) Gas-Light Company, addressed to their gas consumers and the public, will be found in the advertising columns, and will explain itself.

Capitalists will notice the Comptroller's advertisement for proposals for $275,000 of the Croton Water stock. No better investment can be had anywhere. The revenue is certain, and free from all political and commercial contingencies.

Messrs. George H. Kitchen & Co., and Stephen Scammon, engineers and contractors for gas-works, advertise their works by extensive engravings, in this number.

Mr. D. E. Hill, of Middlebury, O., advertises on another page stone ware drain pipe, to which the attention of the Sewerage Boards of our various cities is respectfully called. Since the enormous foreign contracts made by Brooklyn, N. Y., and other American towns, as heretofore mentioned in this Journal, an impetus has been given to the American manufacture, which has resulted in the production of a superior description of pipe. Mr. Hill's establishment is on an extensive scale, and he desires a chance to estimate for contracts that will be offered in the Spring, at any part of the Union.

Mr. A. L. Bogart advertises Rights for sale of Gengembre's gas-meter fluid. We used that fluid last winter, and found the greatest benefit from it; the meter registered accurately the coldest weather.

Messrs. F. Butts & Co. announce the formation of their new house, which will have the exclusive control of the Sterling Coal and Mining Company, whose coal is in extensive use by the American gas companies.

Gas Thermometers.—We have just received a fresh supply of these indispensable instruments for ascertaining the temperature of the gas while passing through the station meter. They will be sent to any part of the United States on receipt of the cost—$10 each. They will save their cost many times over, every year, in the economy of gas which they insure.

THE WATER-WORKS OF AMERICA.

Harrisburg, Pa.—Water-works have adopted Worthington's meters, and one of his duplex pumps, which raises 900,000 gallons in twelve hours, and, according to their report, "works to admiration."

Danbury, Ct.—Water-works going on bravely. Will adopt Worthington's meters and pumps. John W. Bacon, Esq., is the water commissioner, and to him we are indebted for much valuable information and many kind offices.

Birmingham, Ct.—Water-works are in full operation here.

Wilkesbarre, Pa.—Very good water-works here.

Hamilton, C. W.—The Water Commissioners give notice to parties who have plumbed their houses, or intend doing so, for water, that the Commissioners will require all the taps used for the purpose of drawing and shutting off the water, to be on the compression principle, to be approved of by the Board.

Progress of the Baltimore Md., Water Works.—A large force of men are now steadily engaged at work upon the water works. The two reservoirs, of very large dimensions, near the northern suburbs of the city, have been embanked in the most substantial manner, and the large supply pipes connected therewith. These pipes, or mains, are being laid from the reservoirs to the lake and dam, about six miles distant. The line of excavation passes alongside of the Northern Central Railway, and the mains, of which there are two lines, are imbedded to the depth of nearly ten feet. They lie within a few inches of each other, and the sections are joined in a very thorough manner. The excavations already extend several miles, and the whole work is one of interest. A large quantity of fine building stone has been taken from the excavations, but thus far very little blasting has been rendered necessary. The contractors are Messrs. Maxwell and Snyder. The trains of railway along the work are limited to a speed of six miles per hour.

Williamsport, Pa.—Water Works a private corporation. The reservoir is made by throwing a dam across the stream to hold a body of water for the use of mills below on the stream, during droughts, and a smaller reservoir included in the other for the supply of the town, into which small reservoir the water is led by pipes extending from it some 600 feet, through the larger reservoir to the pure water of the stream at the head of the large reservoir.

MISCELLANEOUS ITEMS.

Lynchburg, Va.—These gas-works use clay retorts without exhauster, and consider them far superior to iron. They were the first small works in Virginia to use them. The stock is selling at $26½, par value $25. It pays 10 per cent. per annum. Price of coal, 20 cents per bushel. We hope to receive their report for the year 1860. Their make of gas will be about 6,000,000 cubic feet. Charge to consumers, $4, with 5 per cent discount, No meter rent.

Westfield, Mass.—This town was illuminatnd for the first time on the night of Nov. 25th, with 100 consumers. Notwithstanding the gloom over the manufacturing portion of the town, in consequence of the southern political troubles, the "new light" was inaugurated amid great rejoicings. The works is almost a duplicate of the Greenfield, Mass., gas-works. Dimmock, Dwight & Co., engineers. Generation was 15,000 cubic feet per diem; holder, 15,000 do., do. J. K. Brick & Co.'s clay retorts, Code, Hopper & Gratz's meters, Woodruff & Beach's holder, Earle's mains and purifying apparatus. Use Newcastle and Ince Hall cannel coals. Cement joints. Capital, $25,000.

Willington Quay Gas-Works, near Newcastle-on-Tyne, England.—Sole proprietor, Addison Potter; engineer and manager, George A. Allan.

Keene, N.H.—Gas-works built by Mr. Josiah Carter, of Harrison square, Mass.; capital, $25,000; incorporated, June, 1860; use iron retorts, wet lime purifiers, cement joints in street pipes; about 150 consumers; J. H. Carter, Pres.; Solon A. Carter, Treas.

Advance in the Price of Gas Coals.—In consequence of the great demand for gas-coals in England, the owners of the Durham gas-coal collieries have resolved to raise the price 6d. (12 cents) per ton, and the demand is still such, that another 6d. will probably be added shortly. This advance will doubtless have a corresponding effect upon American gas coals.

Water-Gas in the Eastern Villages.—The Boston *Commercial Bulletin* announces that water-gas works are being erected in two villages in Massachusetts, one of which is near Boston: so that soon we shall have a more reliable report of the working of this process than can be obtained from its operation in a hotel. It is said to be contemplated also at San Francisco, Cal.

Preservation of Gas and Water Pipes.—In scientific matters there is an item worth recording which may save English companies some hundreds of pounds per annum if they will take note of it. I allude to the discovery of the fact by a Frenchman that iron gas pipes and water pipes may be kept from rusting by laying them in a bed of clay. It is the discovery of a French workman, who observed the effect on iron pipes in various soils. The Paris municipal authorities consider this of so much importance that they have given him a handsome income for life as a reward.—*Lon. Corr. Leeds Mercury.*

The first Subway for Water and Gas Pipes in London.—Our readers are aware that the Metropolitan Board of Works, with a view to obviating the expense attending the breaking-up of the pavement for the repair of mains and pipes, sewers and other underground works, determined, in making the new Covent Garden approach, to form a subway under the street for the reception of gas and water mains, electric telegraph conductors, and other matters. The construction of this subway in the street commencing at the corner of Long-acre, opposite the end of Cranbourn street, and 318 feet in length, is proceeding rapidly. The arch of the subway is 12 feet in span, and 1½ inches thick. The headway in centre is 6 feet 6 inches. There are side passages to admit of connection with houses. The sewer, 3 feet 9 inches by 2 feet 6 inches, is below the road level of the subway. On either side of the subway, at a short distance from it, the vaults for intended houses are being formed. We must applaud the Board and their architect, Mr. Marrable, for the improvement thus inaugurated. Mr. E. Thirst is the contractor employed. Mr. W. Fisk is the clerk of the works.—*London Builder.*

Smoke from Gas Lights.—It is pretty generally imagined that the smoking of ceilings is occasioned by impurity in the gas, whereas, in this case, there is no connection between the deposit of soot and the quality of the gas. The evil arises either from the flame being raised so high that some of its forked points give out smoke, or more frequently from a careless mode of lighting. If, when lighting the lamps, the stop-cock be opened suddenly, and a burst of gas be permitted to escape *before* the match be applied to light it, then a strong puff follows the lighting of each burner, and a cloud of black smoke rises to the ceiling. This, in many houses and shops, is repeated daily, and the inevitable consequence is a blackened ceiling. In some well regulated houses the glasses are taken off and wiped every day, and before they are put on again, the match is applied to the lip of the burner, and the stop cock cautiously opened, so that no more gas escapes than is necessary to make a ring of blue flame; the glasses being then put on quite straight, the stop-cocks are generally turned, until the flames stand at three inches high. When this is done, few chimney-glasses will be broken, and the ceilings will not be blackened for years.—Sir John Robinson.

Street Pressure-Registers.—A number of pressure-registers are to be immediately put up in the streets of Philadelphia, to enable the pressure at different parts of the city to be ascertained at all times. This is a great improvement, and will no doubt be adopted here and in other large cities.

COAL-OIL.

IMPORTANT PATENT DECISION.

THE JAMES YOUNG COAL-OIL PATENT AGAIN SUSTAINED IN SCOTLAND.

At Edinburgh Scotland, after a trial of six days, commencing on the first of November, before the Lord President of the Court of Session and a jury, between Mr. Young and his partners and the Clydesdale Chemical Company, for the infringement of Young's Coal Oil patent, the jury rendered a verdict for the plaintiff on all the issues.

As usual in such cases, the defendants set up that the process described in the patent was well known to the scientific world before the date of its alleged invention by Young. To support this, all the old fossil apothecary books, chemical works, encyclopedias, and French and English patents, of late so fatiguingly inflicted upon the puplic by Frank Storer and others, were dragged into Court, where a number of chemical experts (?) stood ready to swear, and did swear, that out of the old, dry bones they could construct Mr. Young's living invention. Nevertheless, the judge and jury failed to recognize in the grinning skeleton, thus built up from the exhumed remains of decayed abortions, any likeness to the progeny of Mr. Young.

These very disinterested and chemically learned expert gentlemen undertook to show that a sufficient description of the process was contained in a paragraph in Kane's Chemistry, but the author of the book, Sir Robert Kane, appeared on the stand, and swore not only that the article in the book would not fairly bear any such construction, but that he had no such idea when he wrote it, and that so far as his knowledge of the art, and books, extended, Mr. Young was the first discoverer of the process patented by him. To meet this, it was suggested "that Sir Robert Kane might have pointed it out in his book although not aware of having done so." This brilliant proposition did not altogether satisfy the Lord President, who remarked in his charge to the jury, "Why, if he was not aware that he had done so, though he had written the book, you will judge whether it was so pointed out that it was generally known. I don't know whether you will consider him the best exponent of his own book or not."

This is only a small specimen of the ingenuity of these expert chemists, which seems to have had no other effect than to disgust both court and jury.

Notwithstanding the defence consisted of nothing more nor less than a repetition of Frank Storer's review of Dr. Antisell's work on coal oil, exeept the very small part that relates to Dr. Antisell and his book, it failed to convince either the Lord President or jury that Mr. Young's invention consisted in the advent of Boghead coal, or that for any other reason the patent was invalid.

This time both judge and jury were of one mind, and the verdict may be regarded as finally and triumphantly establishing the validity of the patent, both in Great Britain and in this country.

COAL MINING IN SCHUYLKILL CO., PA.

The veins being found, almost invariably, lying at inclinations from 10 to 90 degrees, the question has occasionally been brought forward—whether it is more economical in the end to mine coal by commencing at or near the bottom of a basin, and working the different lifts upward towards the outcrop of the veins; or, as is now almost universally done, to begin at the first lift and work it to the outcrop, and when that level is finished to go to the next lowest, and so on to the bottom of the basin. This question has hitherto been almost entirely of a theoretical character, owing to the fact that the vein being naturally reached by slopes sunk on the beds themselves, the operators would have been unable to go to the expense of sinking so deep at first, and of erecting the heavy machinery that would have been needed. The time is now coming however when this subject will present itself in a practical form. A large amount of the coal of this region lies so far below the surface that it cannot be reached except by sinking shafts through the measures; and when it is reached, the landowner and operator will have to decide as to how it is to be worked. It is a favorite notion with some miners that the coal should be worked from the bottom upward, and the principal reason given is that the surface water will not in that case give any trouble. Now, aside from the well-known fact that but very little water is met with after you go down to the third lift below water-level, and also that there will be but little surface water to fear in shafts—one or two large pumps will obviate the whole difficulty. The extra expense for pumps would be but a trifle when compared to the great loss of coal, and the increased cost of timbering, consequent upon the adoption of this plan. When pillars of coal are left standing for any great length of time, the coal in them will get crushed, and extra timbering will be required for the gangway.

SERIOUS ACCIDENT FROM AN EXPLOSION OF GAS.—On Wednesday last, the 28th Nov., while Mr. Charles Wooster was preparing to light up his new gas-works at Riverdale, N. Y., he directed one of his men to search on top of the gasometer for a leak, when the man, who had ascended with a lighted torch, tipped the top of the gasometer, causing an escape of gas which exploded, and injured the man so seriously that he died in a few hours. Mr. Wooster jumped through a window of the gasometer house, but is so badly burnt that it is feared he will lose his eyesight. His face, neck, shoulders and hands are also very seriously injured. He is confined to his house at Yonkers, N. Y.

MISCELLANEOUS ITEMS.

CONSUMPTION OF COALS IN RUSSIA.—The consumption of coals in Russia has risen very rapidly since the last war. In 1857, the quantity imported into St. Petersburg was 142,000 tons, while, in 1858, the quantity shipped to the same port was 270,000 tons, giving an increase of 128,000 tons in that city alone. There is considerable demand for them for use in steamboats, manufactories, and, to a certain extent, in railways; they are also used in workshops and factories. Hitherto it has been considered more economical and less injurious to the machinery to use wood, but the supply of wood not being equal to the demand, and railways extending so rapidly in Russia, the use of coal there is likely greatly to increase. The mines in the Ural Mountains will probably reduce the demand a little when they get into proper working order, and railways are opened out that far East, but that will not be for some years to come. The Russian Government uses annually in St. Petersburg 35,000 tons, the price for steam purposes being about 24s. ($6,) per ton; for house purposes, about 30s. ($7 50) per ton delivered.—*Newcastle (England) Chronicle.*

TEXAS COAL BED ON FIRE.—The Nauvo Express says: "A coal bed between Wild Cat Bluff, on the Trinity, and Mound Prairie, which has been burning slowly for a number of years, has, during the present dry season, made wonderful progress, and ten or twenty acres have been burned over, and the fire still progressing rapidly. Recently, on a gentleman and lady riding near it, the horses broke through the crust of the earth which covers he fire near the edge, and were severely burned before hey could be got out."

JAPANESE COAL.—Chief Engineer W. H. Shock, U. S. N., has reported, in the *Journal of the Franklin Institute*, the results of experiments made with Japanese coal on board the United States steamers Minnesota, Mississippi, and Powhattan. From what can be learned of the Japanese mode of coal-mining (no foreigners are allowed to visit the mines), it appears that machinery is not used, either for raising coal or water, and therefore, as soon as the mines are drowned out, they are abandoned. Hence all the Japanese coal yet used is the outcroppings and surface seams of what might, upon proper mining, prove to be an excellent coal. That with which experiments were made was bituminous, measuring 37 cubic feet to a ton. In burning, it emitted immense volumes of densely black smoke. It contained but a small amount of sulphur, but it formed from 27 to 30 per cent., by weight, and from 40 to 60 per cent., by bulk, of a spongy clinker. The results of several trials gave an evaporation of from 3.39 lb. to 4.4 lb. of water for each pound of coal consumed. The result, therefore, was not favorable, as a ton of Japanese coal would hardly go farther than half the weight of American coal, saying nothing of soot and clinker.

ASTONISHING YIELD OF ROCK OIL.—The *Meadville, Pa., Republican* says: "The greatest oil well yet discovered is that of D. M. Williams, of Warren, whose well is about a mile below Titusville. It seems the owners of this well, not satisfied at receiving twelve barrels a day without pumping, determined to bore still deeper, and recently, after boring two feet deeper, they seem to have struck the very fountain-head of oil. A gentleman who was present and witnessed it, informed us that when they removed the drill from the hole, the oil spouted into the air to the height of eight feet, and literally overflowed everything. Holes were dug in the ground to contain it, as barrels could not be had fast enough to hold it. It has continued to flow at the rate of over 200 bbls. per day."

OIL IN LAWRENCE COUNTY, PENN.—The "oil fever" has broken out in Lawrence county in good earnest. The pump just placed in the well of Messrs. Strawbridge & Co., on the Madoning river, about seven miles from New Castle, is producing a superior quality of oil in quantities exceeding the most sanguine expectations. On Saturday last, one barrel of *bona fide* oil was pumped in fifteen minutes. For miles along the line of the river, leases are taken out, and operations will be commenced soon. In the immediate vicinity of New Castle, surface appearances have indicated oil along the banks of the Shenango, and a company of thirty citizens is being formed to commence boring speedily, directly opposite the town. Among them are Hon. John Ferguson, Hon. W. H. Reynolds, Col. John C. Campbell, (of the Washington House), and other enterprising men, who understand what they are about, and will prosecute the work vigorously and thoroughly. Present indications augur a "ten strike" in this line for "Little Lawrence."

MR. GEORGE ANDERSON, OF LONDON.—Mr. George Anderson, of Leadenhall street, London, the eminent gas engineer, who recently erected the Cork new gas works, has just completed his contract with the Clonmel Gas Company, for the re-construction of their works on the best modern principle. This gentleman is, we understand, lessee of the Dover and Waterford Gas Works, and has within this week taken up the Carrick-on-Suir works also. His patent system of heating retorts by tar alone is a complete success, and has placed him as a scientific and practical engineer at the head of the profession in London. Mr. Anderson's proposal to take a ten years lease of the Carrick-on-Suir gas-works, giving the shareholders 6 per cent., and charging the gas at 7s. 6d. per 1000 feet, having been agreed to at the last meeting, the documents were duly signed and completed, after which the meeting separated.—*Clonmel (Ireland) Chronicle.*

CORRESPONDENCE.

LIGHT, WATER AND SEWERAGE IN HAMBURG.

CONSULATE OF THE UNITED STATES OF AMERICA.
HAMBURG, GERMANY, October 30th, 1860.

To the Editor of the AMERICAN GAS LIGHT JOURNAL:

In reply to your letter of August 1, through the State Department, I beg to hand you the following information respecting the gas and water supply, together with the sewerage, as they are at the present time in this city.

Hamburg, situated on the river Elbe, is the principal commercial city in Germany, and contains, with its suburbs, nearly 200,000 inhabitants.

THE GAS-WORKS.

Previous to the year 1846, the streets of Hamburg were lighted by means of oil lamps. In 1844 a company was formed, with a capital of £100,000 sterling, for lighting the city with coal-gas; at the same time the Corporation entered into a contract with said company to supply the street lamps and private consumers with coal-gas for a term of thirty years. There is one very peculiar feature in this contract, namely, "that after the expiration of the said term of thirty years, the whole of the works, main pipes, lamp posts, &c., &c., are to become the property of the Corporation, the company not receiving any payment for the same." As a set-off to this great sacrifice of property, the company enjoys the exclusive right of supplying the city with coal gas during the above term of thirty years. The present gas-works, which are situated close to the Elbe, were commenced in the year 1844, and in 1846 the city was permanently supplied with gas, and up to the present time the consumption has rapidly increased, the quantity consumed and paid for last year being 303,578,766 cubic feet. The present price of gas is, to private consumers, Cy. 5, 3s. or about 6s. 2d. sterling, ($1 54) and for the public lighting, Cy. 2, 3s. or 2s. 9d. sterling, (68 cents) per 1,000 cubic feet. The gas is manufactured principally from English Newcastle coals, (known as the Pelton Main), and, according to contract, the gas must have such an illuminating power that a batwing burner, consuming five cubic feet per hour, will give a light equal to twelve wax candles, six to weigh one pound.

To light the streets of Hamburg, including the suburbs, 4,500 gas lamps are required; the private consumers exceed 12,000. The present cost of the works, main pipes, &c., &c., amounts to about £225,000; the capital upon which the dividend is paid amounts to £187,500 sterling, and upon this capital a dividend of 22 per cent. was declared last year, and a sum of £10,000 carried over to reserve fund.

THE WATER WORKS.

So early as the year 1531 Hamburg was supplied with water pumped direct from the Alster Bassin, the supply of course being limited and defective. In the years 1807 and 1840 two water works were erected on the Elbe at the expense of private individuals, one of the works being situated below the city, the other just above it. But during the great fire in Hamburg, May 1842, (which destroyed upwards of 1800 houses, besides churches and other public buildings), the supply of water to the fire plugs was found to be so defective, that the Corporation afterwards determined to erect at their cost an extensive works capable of supplying every street, and even the suburbs, with a plentiful supply of water for any emergency. For this purpose a site was chosen on the Elbe side, about two English miles above the city, and called "Rothenburgsort." On this spot fine water works have been erected. The three filter beds occupy an area together of about 650,000 English square feet, and they are so arranged that, by each rise of the tide, they can be filled with water. The water is pumped from the filter-beds through pressure-pipes up to two distinct heights, called the "high and low level," the high level being placed 212 feet and the low level 110 feet above the null point of the Elbe. The pressure-pipes stand enclosed in a circular tower of brick-work, about 244 feet high; in the centre of this tower stands the chimney with which the boiler, furnaces, &c., are connected; this chimney being protected from the direct influence of the atmosphere by the tower, remains warm, and the pipes being placed close to it (between the tower and chimney) they are not acted upon by the frost of winter, &c. For forcing the water up to the pressure pipes, two powerful steam engines are employed, and the arrangement of the machinery generally is upon the so-called Cornish principle.

Since the year 1848 water has been supplied from the new works at the following rates: To large consumers at Cy. 7, or about 8s. 6d. sterling, ($2 12) per 365 hhds.; to smaller consumers at one penny per hhd., and to private houses at about 2s. 6d. sterling (63 cents) per annum for every habitable room in the house, including kitchen and water-closet. In many parts of the city taps are erected, where the poorer classes obtain gratis an unlimited supply of water.

SEWERAGE.

Since the great fire before mentioned, a complete system of sewers has been laid down in Hamburg and the suburbs.

Some of the principal sewers discharge themselves into the Elbe direct, others into the canals with which the city is intersected.

A small river, called the Alster, discharges itself into the Elbe at Hamburg. The water of this small river being confined by sluices, is made to discharge itself through the main sewers and culverts for the purpose of "flushing" them. Most of the better class of houses are

furnished with water-closets, and the streets are well drained, &c.

Where no other measure is named, Hamburg measure is understood.

For the information enclosed I am principally indebted to B. W. Thurston, Esq., C. E., of the gas works in this city, a gentleman who stands very high in his profession, and who is the inventor of a very ingenious method of burning coal tar, saving thereby some 4d. sterling per gallon.

Yours very respectfully,
JAMES R. McDONALD,
U. S. V. Consul.

We thank Mr. McDonald for his intelligent and interesting letter, and have complied with the request contained in his private letter to Mr. Murray. Mr. Thurston's invention for burning coal tar is known to us. It was advertised in this JOURNAL on page 48, August 1, 1860.—ED.

PUBLIC FILTERING OF WATER.

SAVANNAH, GEO., WATER-WORKS,
November 16th, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Yours of the 3d, inquiring how our daily delivery can be 500,000 galls., when the capacity of our reservoir is only 115,000 galls., is at hand. The reply is simply this: We pump into the service pipe at the rate of 40 to 60,000 gallons per hour, the reservoir acting as a vent for the surplus supply; when it becomes full, say from 11 p. m. to 1 o'clock in the morning, we stop; it will be half consumed by three o'clock, when we start again; this reservoir holds hardly enough to last all night. The other day, we had a three inch pipe broken off, we were then obliged to run twenty hours, and pump 1,200,000 galls., 700 000 gal s. being wasted. This was enough to fill the reservoir ten times, and if no water was being used, we could fill it in less than three hours.

You also ask what is the head?—75 feet at base of reservoir, 114 feet at lowest point of city.

In regard to filtration, you are probably aware that there is no water-works in the United States, where public filtration is carried on successfully. We desire to filter, but are afraid to undertake it. I have made the matter my study for the last four years, and have had access to the parliamentary reports on this subject, in Great Britain, where all the scientific men of the country expressed themselves. I have the plans before me of Liverpool, Chelsea, Paisley, and other cities; I have corresponded with Mr. Duncan, Engineer of Liverpool Water-Works, a gentleman of large experience, and probably one as conversant with this subject as any person in this country. But the plans of Europe will, I am afraid, not avail for the Savannah river water, and I would be glad to hear further upon the subject. I conversed with Mr. Craven, of your water works, who was our consulting-engineer, but I found him totally ignorant of the subject. You cannot find a more interesting subject for publication, to water-works men, if you can find anything novel upon this point.

I believe I put the length of our mains down at 14 miles,—it was a mistake. By looking at our first annual report, you will find that 16 miles were laid originally, since that, about 3 miles,

Respectfully yours,
R. D. GUERARD, Supt. S. W. W.

We would be glad to hear from the British Water-Works on the subject of filtration.—ED.

LIGHT AND WATER IN NEWFOUNDLAND.

CONSULATE U. S. A., NEWFOUNDLAND,
St. John's, Sept. 13th, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

In reply to your favor of August 1, just received, I beg to state that the dividend on gas is 8 per cent.; illuminating material, coal; population of town, 25,000 to 30.000; consumers, about 8,000; cost, per thousand feet, $3 60.

Water.—Extensive works are now being prepared, to cost $250,000 to $300,000. Pipes and other material being imported from the United Kingdom. Respectfully yours,

W. S. H. NEWMAN,
U. S. Consul.

LIGHT AND WATER IN VERA CRUZ.

CONSULATE OF THE UNITED STATES,
VERA CRUZ, Oct. 24th, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Your letter of the 1st August, soliciting particulars as early as possible of the gas-light and water companies of this place, addressed to Mr. Twyman, late U. S. consul at this place was duly forwarded to the consulate by Colonel J. T. Pickett, the successor in office, who is now in the city of Washington.

In reply to the same, I beg leave to say that both the gas-light and the water-works are the property and under the immediate supervision of the *ayuntamiento*, (city council,) the latter—water-works—not being completed for want of funds, and on account of the continued revolutionary state of this Republic. The former—gas-works—however, are in operation, and the charge to consumers at present is at the rate of six dollars per 1,000 feet.

The illuminating material used at this place is coal; up the country, Jalapa and Puebla) I understand, liquid gas is used exclusively, whilst, in the city of Mexico, gas is said to be made out of wood and rosin.

There is no sewerage at this place. The population of this city is estimated at from ten to eleven thousand.

I beg to add that I have been promised more minute particulars as to cost, &c., and shall not fail to communicate with you again as soon as I succeed in obtaining that or any other information bearing upon the subject. I have the honor to be, sir, most respectfully,

Your obedient servant,
CHARLES RIEKEN,
U. S. Vice-Consul.

LIGHT AND WATER IN CENTRAL AMERICA.

U. S. CONSULATE, CARTHAGENA, C. A.,
5th October, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

I would, with the greatest pleasure, have answered your queries contained in your esteemed favor of the 1st of August, but there being in this city no companies of light or water, there cannot be any capital nor dividend. I believe even that I am not mistaken in giving you as a fact that in the whole of New Granada there is no such a thing as a public company to light the streets. Everybody uses the red palm o l, generally in a tumbler or a cup just as on the coast of Africa. The streets are lighted by the inhabitants, who are supposed to have the means to stand the expenses; but you may imagine what kind of light that is; if the inhabitants of a street are all poor, there is of course no light.

We use rain water, received in cisterns built by the old Spaniards, or the water of some wells that is not brackish. A ten-gallon keg of cistern water is retailed at five cents, a gallon palm oil at eighty cents. Some cocoa nut oil is also used, and sold at the same price.

Yours very respectfully,
ALBERT MATHIEU,
U. S. Consul.

LIGHT AND WATER IN PORTO RICO.

CONSULATE, U. S. A., PONCE, PORTO RICO,
1st October, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Your letter of 1st August has come to hand, and its contents noted. The JOURNAL has also had my perusal. In answer to your inquiries I beg to say that there are no gas lights nor water companies in this city; that the streets are not lighted up, but here and there by oil lamps, which private individuals hang over their doors.

Sperm, adamantine and tallow candles are much used, also olive oil from Spain. Kerosene and lard oils are now coming into vogue. At foot you will find cost of same. The duties are very heavy. This city is almost surrounded by a river; that and the wells that every private house has supply the whole population with an abundance of water. The population consists of 15,000 whites and 5,000 blacks.

Sewerage is not yet known here.

Should any information that I may think of interest come to me hereafter, I shall at once advise you of same. I am, sir,

Your obedient servant,
MAN. A. TORO,
U. S. Vice-Consul.

Sperm Candles	50 and 60 cents per 100.
Adamantine do	28 and 32 do.
Tallow do	10 and 22 do.
Olive Oil, Spanish jug	$2 to $3 per jug of 2 gallons.
Lard Oil	$1 to $1¼ per gallon.
Kerosene Oil	$1¼ to $1¾ "

LIGHT AND WATER IN PARIS.

U. S. CONSULATE, PARIS, FRANCE,
13th October, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Your letter of the 1st August was duly received through the State Department. I have only at this date been able to obtain a part of the information desired by you. The "*Compagnie Parisienne de Gaz*" have furnished me with the following details:

Capital employed up to this time in shares,	55,000.000 f.
" " " " loans,	20 000,000 "
	75,000,000 "

Dividends upon the shares, 12 per cent.

Material employed for the fabrication, French and Belgian coal.

Price of gas the cubic metre, 30 centimes for private persons; 15 centimes for public purposes.

Population of Paris since the enlargement, estimated at 2,000,000.

I will add that gas is not employed so generally in private houses as in New York. It is rarely used except to light the stairs, ante-chambers and kitchens, and sometimes the dining-rooms, being considered a less agreeable light than the wax or stearine candle.

I have as yet been unable to gain any special information relative to the supply of Paris with water, but as soon as I can do so will cheerfully communicate the same to you. I am, sir,

Your obedient servant,
HENRY W. SPENCER,
U. S. Consul.

THE JOURNAL IN SEMINARIES OF LEARNING

MT. CARROLL SEMINARY, CARROLL CO., ILL.
November 15th, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

We address you to solicit the AMERICAN GAS-LIGHT JOURNAL in exchange for our paper, the *Seminary Bell*, a copy of which we send you. We do not presume to ask this because of *merit* which our little sheet possesses, that would render it in any degree an *equivalent* for your valuable JOURNAL; but because we wish it to place in our reading-room, which, together with the attention we may call to it through our paper, we are confident will in time result much to your advantage.

We should regard it as a valuable acquisition to our reading-room, and hope, if not for the advantage that you may derive from its introduction here, you may, as an act of generosity, grant our request.

Very respectfully,
T. A. W. SHIMER & GREGORY,
Principals.

We comply with this request with great pleasure, and further give notice that we will send the AMERICAN GAS-LIGHT JOURNAL free of expense to any and every institution of learning in this and any other country, that wishes it, of whatever religious denomination, that cannot afford to pay for it.

So far from considering it an act of generosity on our part, we feel it to be a favor conferred upon us to accept it for the instruction or amusement of the students.

We have received two numbers of the *Seminary Bell*, the editors of which, it appears, are ladies. The *Bell* is full, as all belles are, of love and hope and enthusiastic impulses, which we, poor devils, know nothing of, except by grafting from the other sex. The Seminary is reported to contain 368 students, of whom 206 are young ladies, and 162 are gentlemen—we should think that the men were the belles there;—not a bad place to be educated in, by the bye, and if we were a quarter of a century in the rear of time, we might speak for a desk there.—ED.

GAS-LIGHT IN BREMEN.

CONSULATE OF THE U. S. A.,
BREMEN, October 31, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

In answer to your enquiries through the Department of State, I beg leave to say, that the price of gas in this city (population 85,000) is 4 Bremen thalers per 1,000 cubic feet, or about $3 American currency. The gas is made from English stone and bituminous coal, but the light is not good, its strength being about equal to two wax candles per cubic foot.

In Hanover gas costs only 1 Prussian thaler and 20 silver groshen per 1000 cubic feet, or about $1 20 American money: made from German coal and the light very poor.

In a few days I will have the pleasure of sending you a pamphlet containing all about the gas companies of Germany. I am, very respectfully,

Your obedient servant,
ISAAC R. DILLER,
U. S. Consul.

AN ENGLISH BARONET A JOURNEYMAN GAS-FITTER IN NEW YORK.

GAS-WORKS, KITTERING, ENGLAND,
19th October, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

You will please to accept my thanks for the present of a copy of your AMERICAN GAS-LIGHT JOURNAL of the 1st inst., to hand yesterday.

I take the liberty of correcting your particulars of our gas company. Owing to the great increase of our trade we have been compelled to enlarge our works, purchase more land, erect additional purifiers, and increase the size of our inlet and outlet mains, as well the size of our retort house. To effect all this the company have created new shares, and increased their capital to £5,000. The new shares were all taken up by the old shareholders, and are worth £5 premium.

Whilst writing to you on the above home subject, I think it right to inform you that Mr. Barlow has published "The proceedings of both houses of Parliament on the Metropolis Gas Bill," and that, from the disclosures elicited in the examination of the different witnesses, a great body of information on the working of the London companies that can be found from no other source, and from the tone of your leading article, it appears to me is the very thing you want. [We have sent for it—ED.]

I will now trouble you with a subject of a very different nature, and which no other man living that I know, can give you except myself.

These works were erected in 1834 by Mr. Barlow, the father of the present editor of the Gas Journal; his principal working man here was a person named Hall, who had just returned from New York, where he had assisted in the erection of the Manhattan gas works; he had an assistant, a native of this place, of the name of William Norwich, a lineal descendant of Sir Thomas Norwich, Baronet, a man of great figure and high standing in the reign of Charles II. He was a great persecutor of the non-conforming clergy, who were ejected by the famous, or rather infamous, Bartholomew Act of 1662; and the

Rev. Mr. Maidwell, rector of Kittering, was twice consigned to Northampton jail for preaching after his dismissal from his living by Sir Thomas. Some few years afterwards he was gored to death by his own bull in his own park at Dingley. He owned that lordship, Brampton Ash, and many other estates; he left a son, Sir Roger Norwich, who gave way to gambling, and lost his estates by that means; his son, Sir John Norwich, became a drunkard, and in his life every vestige of former greatness was lost. The father of the (future) American Norwich was reduced to poverty, though still assuming the family title; this man I well remember.

Well, under the auspices of Hall, William Norwich became an expert in the minor details of gas engineering. Now William, though quite a poor man, had the family *penchant* for high living, and being an excellent shot, he became obnoxious to the owners of preserves of hares, partridges and pheasants, and was several times made amenable to the laws as a poacher. Hall had instructions from the managers of the New York works to send over an English stoker, and he persuaded Norwich to accept the appointment, but the difficulty was to raise the ways and means. Under these circumstances he applied to me as secretary and superintendent of these works for assistance, and knowing the pest he was to the nobility, gentry and clergy, owing to his propensity and success in poaching, I applied to them and raised the means of sending him to New York. He had a sister married living at Leicester, miserably off, and he twice sent me a £5 Bank of England note to relieve her necessities, and I believe at last sent for her and family to America.

Now this man I have not heard of for many years. I should be glad if some kind-hearted soul would let me know what has become of him. I am, sir,

Your obedient servant.

GEORGE GILL.

On receipt of the above letter, we placed it in the hands of a friend posted up in gas matters, who soon informed us that Mr. Norwich was living quite obscurely in the basement rooms of a rear building at No. 73 West Twenty-seventh street, where we found him one evening last month enjoying his *otium cum dignitate* in a clean shirt and home-made pants, his industrious wife ironing at a table in the same room. The apartments though humble, were the pink of neatness and frugality. The first glance at Mr. Norwich bore testimony to his good birth and love of high living, although he has precious little chance at *ragouts imperiales* or *petites grenouilles*, now-a-days.

Mr. Gill's letter was listened to with much interest, and parts of it moved the listener to tears. When we came to the poaching scrapes, he pricked up his ears like an old hunter at the sound of the Tally ho! and exclaimed, "Tell Mr. Gill I have had better shooting in this country than all England can afford. I have shot 178 head of quail in one day in Pennsylvania, and fired off three quarters of a pound of best English diamond powder and fourteen pound of shot in the same space of time, and no restrictions on my shooting, either."

Mr. Norwich, or by his title, Sir William Norwich, if indeed the Baronetcy is not run out, and the title still exists, has been in this country about twenty-six years, fourteen of which he was in the employ of the Manhattan Gas Co.; latterly he has been with Baker, Smith & Co., 180 Centre st. He is about 50 years old, and is now out of employment. The best thing that can be done for him, if there is anybody left to do it, is to take him back to England to pass his days near the home of his ancestors. He was much moved at their history, of which he was partially ignorant, having left home when quite a youth, and at that time indifferent to them and everything else.

Here is an instance of a veritable English baronet a journeyman gas-fitter in New York; but this is nothing new with us. Louis Phillippe, the last King of the French, was a school teacher in Pennsylvania, and was jilted by an independent Yankee *gal*, who thought she could do better, which she no doubt did. Napoleon III., the present emperor, was a sort of hanger-on-about-town in this city for some time, and once or twice rested his weary limbs in the old Bridewell in the Park, for mistaking a lady-of-color for a lamp post, while seeking temporary support to look at the time o' the morning, on his way home from supper or play. Garibaldi left a tallow chandler's shop on Staten Island the other day to redeem Italy; his partner is in it yet. William IV. of England, when Prince William Henry, had his ears boxed for a rude bit of gallantry in a beer garden in this city, while on a visit here many years ago. Joseph Buonaparte, ex-king of Spain, cultivated a farm at Bordentown, N. J. Marshal Grouchy, who led the cavalry at the battle of Waterloo, Marshal Clausel, who commanded in Africa, General Moreau, the competitor with Napoleon I. for military fame, Count Bertrand, who accompanied the emperor in his exile at St. Helena, General Bernard, the chief of the French Engineers, Count Regnaud St. Jean d'Angely, a privy councillor and minister of the Empire, the two generals Lallemand, with hundreds of others of minor note, sought a refuge in this country from persecution in the old world, some burying themselves in the wilderness of our vast interior, while others gained a subsistence in conferring upon our youth in various schools, the light of their own acquirements.

It was only the other day that we bid God-speed to the future king of England, after a brief visit to these unmitigated Yankees, who are in themselves a nation of individual sovereigns, each one reigning on his own hook. And to our own military titles we are not exactly indifferent either; our hotel business is never degraded below a colonelcy; captains command brigades of dirt carts, and majors sell bad liquors at three cents a glass. There are seventeen native born Princesses of Wales—already danced with—prepared to sail for England at a moment's notice; and but one "retired private" in all America.—ED.

DOES THE QUALITY OF THE GAS AFFECT THE REGISTRATION OF THE GAS-METER?

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

My attention has been directed to a letter, on page 156 of your JOURNAL, dated Bacup, Lancashire, England, upon the question, "Does the quality of the gas affect the registration of the gas-meter?"

I would answer, no, it does not; a meter will register the exact quantity of the gas that passes through it, and this registration is not changed by the quality of the gas. Had the question been, "Will a poor gas, of low specific gravity, pass more rapidly through a gas-burner, or other small orifice, than a rich gas of high specific gravity, the pressure and all other conditions being the same? I would have answered, yes; the poor gas will pass more rapidly, in proportion to the square roots of the specific gravity of the two gases. For instance, suppose in 200 hours, a burner passed 1,000 cubic feet of gas, of the specific gravity of 0.6, then the same burner, in the same time, under the same pressure, would pass 1,224 cubic feet of gas of the specific gravity of 0.4. This is based on an established law, which governs the flow of gases through small apertures. It is unnecessary to quote authorities, I will merely make an extract from Professor Bunsen's "Gasometry," to show that the specific gravity of gases may be ascertained by the comparative *time* required to pass a given orifice. "It often happens that only a few cubic inches of gas are at the disposal of the analysist. In such cases I employ another method, which gives results of sufficient accuracy even with two inches of gas. This method is based on the fact that the specific gravity of the two gases, which, stream out of a fine opening in a thin plate, *are very nearly proportioned to the square of the time of effusion.*"

I extract from the same work the time that a certain volume of air, and an equal volume of other gases, required to pass through a small orifice in a thin plate ofplatinum, each experiment under the same pressure.

Time.	Time.	Specific Gravity. Air—1.
105.5 Air.	29.7 Hydrogen.	0.069
102.5 Air.	108.5 Oxygen.	1.106
102.7 Air.	127.0 Carbonic Acid.	1.520

The reasons given by your correspondent, "Clarior e Tenebrie," for the more rapid flow of poor, or light gas, I do not think tenable. ("First," That the light gas increases the pressure in the mains and meters.) If the light gas passed through the gas holder, then the pressure would be decreased, for the lighter the gas the less would be the pressure from the gas-holder. If it passed through a governor, then the pressure would be the same with the light gas as with the heavy gas.

("Second," A large proportion of hydrogen increases the heat of the flame, causing the gas to flow faster from the orifice of the burner.)

No doubt that the lighter the gas, the hotter the flame at the burner will be; the effect of this increased heat will be to give additional heat to the gas-burner, and the tube connected with it, then the gas in passing to the orifice of the burner would be more expanded, as the expansion is 1-491 parts in bulk for each degree Fahrenheit of additional heat, and the gas would require longer to pass the orifice of the burner in consequence of its increased volume.

R. G. C.

Louisville, Kentucky, Nov. 26th, 1860.

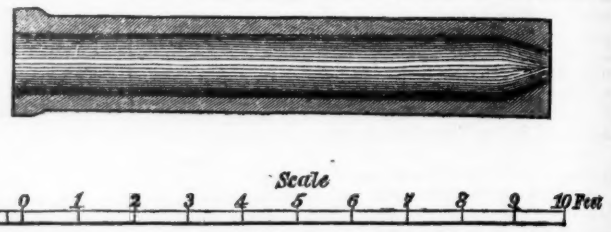
OPEN-ENDED RETORTS.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Responding to the invitation kindly given in No. 19, Vol. 2d, of your valuable JOURNAL, I send for your acceptance the enclosed tracing, taken from the plan of our retort setting.

There is no new principle brought out in the setting. The only thing to be remarked, is, the division of the oven by a 5 inch wall, run up, to the top of the arch. And which division of the oven may be carried, I believe, with advantage, to a much greater extent than has been done in the present instance, as I find, that by lessening the cubical contents of that portion of the oven heated directly from the furnace bars, the heat is intensified. And from command over the draught, which we have from the position of the dampers, the heat is regularly distributed over the entire length of the retorts.

The form of retort shown, was fully described in a letter of mine, published in your JOURNA for November, 1859, page 105, and let me here remark that I lay no claim to the invention of it. My attention was directed to it upwards of ten years ago, by a lithographed circular being put into my hands, which is still in my possession, and can be seen by any one interested in the matter. On this circular is depicted the figure of a retort about 9 feet long, and 14 inches diameter inside (a tracing from which I enclose). I noticed particularly the fact of its having a *conical end, with a hole 6 inches diameter* through it, and being convinced of the advantagesuch a form of retort would give in small gas-works, such as ours, I decided on adopting it as soon as an opportunity occurred.



Six years ago it became necessary to enlarge our works and we decided on throwing our retort house into the form shown in section of Fig. 1, so asto admit of the introduction of open-ended retorts, and where ample room is provided for doing whatever may be required about the bench, or lengthening the retorts, if it should become necessary to increase our gas-producing power.

The main body of the oven is shortened by a wall C D, embracing all the retorts. It is carried up, and ends immediately in front of the opening leading downwards from the top flues, and is pierced with two portholes, one on each side of the upper retort. The whole of the heated air descends between that wall and the outer one, around and between the back ends of the retorts, and so into the main flue.

The draught is regulated by two dampers, one of which is placed on the top flue, and the other at the end entrance into the main flue.

The conic l ends of the retorts are fitted up with socket mouth-pieces only three inches long, having lids and screwed bars in the ordinary way.

With the exception of the saddle blocks, on which the upper retorts rest, no "lumps," "blocks" or "guards" of any kind are used in building-in our retorts. Nothing but ordinary sized fire-bricks and finely ground fire-clay. With fire clay we also make all the joints on the mouth-pieces. The faucet joints on the top of the upright pipes are, after the insertion of a round or two of rope yarn, filled with finely sifted fire-clay, well caulked in, and it is seldom that tar ever makes its appearance through it.

To render the outer surfaces of the joints hard and firm, we smooth them over with a sprinkling of fine iron borings, which, when well rubbed in, has the effect of rendering them perfectly gas and tar-tight to the end.

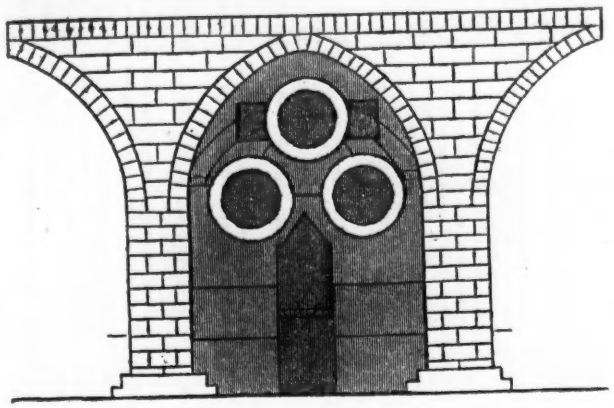
As an instance of the "tear and wear" which our retorts sustain, I may mention that in May last, we pulled down three retorts, 7 feet 6 inches long, and 14 inches diameter inside. They were wrought for four years, and as we have six retorts working in the winter season, ifwe take half the quantity of gas sold during that time as the production of three retorts, we find that the quantity made per retort amounted to nearly 2,050,000 cubic feet. I hope that the publication of this description of the building-in of our retorts may stimulate some of our cousins on your side of the Atlantic, to make experiments on the best tform of retort, and manner of building them in, as it is evident, from the great quantity of material required for renwals, and large amount of fuel needed to generate the heat necessary to profitable gas-making now-a-days, that much room remains open for the exercise of that ingenuity which gas managers, as a class, generally possess.

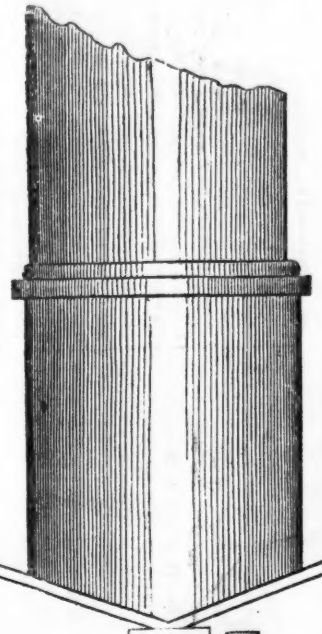
Yours truly,

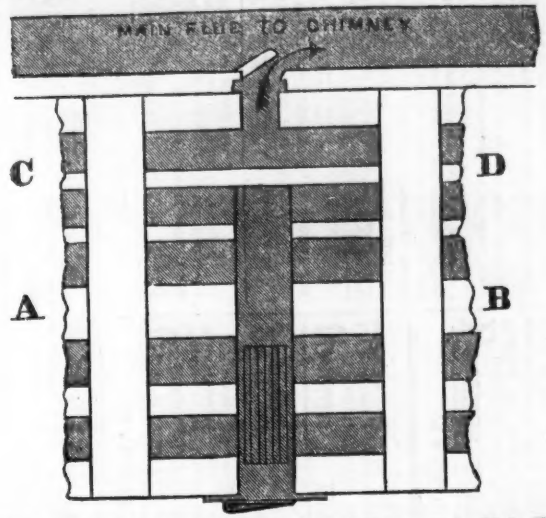
JAMES ROBB.

Gas-Works, Haddington, Scotland, 20th October, 1860.

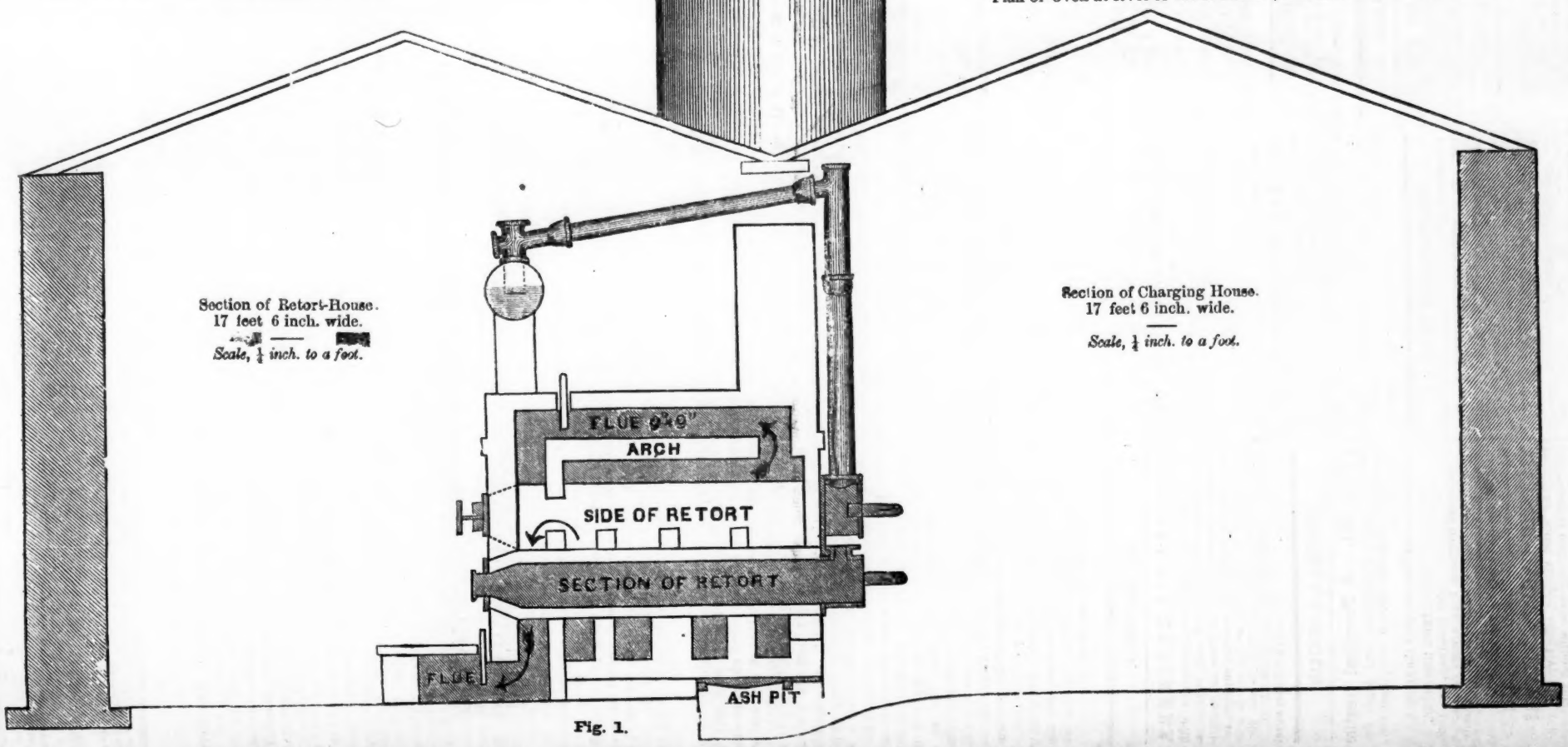
Sectional Elevation of Oven and Retorts on the line *A B*, looking towards the Division Wall *C D*, marked on the plan. The dotted circular lines, represent the Flying Buttresses for supporting the upper Retort.







Plan of Oven at level of lower Retorts, and Entrance to Main Flue



Section of Retort-House.
17 feet 6 inch. wide.
Scale, ½ inch. to a foot.

Section of Charging House.
17 feet 6 inch. wide.
Scale, ½ inch. to a foot.

Fig. 1.

ENGRAVINGS TO ILLUSTRATE THE LETTER FROM JAMES ROBB, Esq., Dated HADDINGTON, ENG., Oct. 20, 1860.

PATENTS.

Inventors are informed that Patents are procured at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, through F. C. TREADWELL, Jr., Esq., an experienced Patent Agent and Expert, in the United States, and in all other countries where Patent Laws are in force.

UNITED STATES.

30,556.—C. E. Atherton, of Paterson, N. J., for an Improvement in Vapor Lamps:

I claim the combination and arrangement of the gas receiver, the self-acting valve or gage at the top of the generating tube, with the use of the metal rod and beveled pin, substantially as and for the purpose set forth.

30,568.—M. W. Dillingham, of Charlestown, Mass., for an Improvement in Vapor Lamps:

I claim the application of the valve, O, and cup, E, to the wick tube, in such manner as to enable both valve and cup to turn together on the wick tube, and with respect to the lateral discharging orifice thereof, as described.

Also, the arrangement and combination of the cup or thimble, E, the gas heater, C, the wick tube, A, and its burners, the whole being as specified.

Also, The arrangement of the conduits or passages leading from the wick tube through the cap, B, the heater, C, and into the burner, D, as described.

Also, The arrangement of the jet holes, f f, of the slit, e, of the burner, viz., at the termini of such slit, as and for the purpose described.

30,574.—G. C. Hinman, of Portageville, N. Y., for an Improvement in the Seats of Water-Closets:

I claim the combination of the cord, C, pulley, D, and weight, E, with the seat, B, for the purpose of making the seat, B, self elevating, substantially as described.

30,575.—J. M. Hunter, of New York City, for an Improvement in Apparatuses for Trying Oils:

I claim, first, The described arrangement and combination of the press and boiler, the former being placed within the latter, for the purpose of rendering oils or other fatty matters by thoroughly pressing the scraps while the same are exposed to the boiler heat or steam heat, substantially in the manner and for the purposes described.

Second, I claim the use of the crib for preventing the scraps from coming in contact with the boiler, substantially in the manner described.

Third, I claim the employment of the pressure heads and right and left hand screws, by means of which the oil may be separated from the scraps, substantially in the manner described

30,578.—Henry Johnson, of Washington, D. C., for an Improvement in Vapor Burners:

I claim so placing the reservoir or fountain in relation to the burner that the lowest point of the fluid shall be at or about the level of the burner, and the highest point below the level of the top of the generator or gas pipes, b c, in the manner and for the purposes set forth.

I claim covering the upper ends of the gas pipes, b and c, by the screw cap, e, constructed as set forth, so as to embrace the open ends of these pipes in one open common cavity in the cap and screw over them, in the manner set forth.

I claim the elevated conductor, n n', rising above the highest level of the fluid in the fountain, as set forth.

30,591.—J. G. Ross, of New York City, for an Improved arrangement of Gates for Directing the flow of Water Upon Tide Wheels:

I claim the arrangement of the gates, b d d', for directing the flow of water in combination with the swinging gates, h h and i i, for regulating the filling or emptying of the pond, and with the gates, f f', to regulate the supply to the wheel, in the manner and for the purpose specified.

30,603.—Benjamin Douglas (Assignor to W. & B. Douglas), of Middletown, Conn., for an Improvement in Pumps:

I claim the use of tube, a a, for encasing the piston rod and preventing the escape of air through the stuffing box around the piston rod, when it also controls the upward movement of the check valve substantially as set forth.

30,605.—Thomas King, (assignor to I. A. Pulsipher), of Troy, N. Y., for an Improvement in Machines for Molding Candles:

I claim, first, The piston like tip molds, D, made movable unequal distances on the sliding frame, F, and provided with the springs, r, or their equivalents srbstantially as and for the purpose described.

Second, The clamp or clamps, G, or any equivalent therefor, applied to the projecting portion of the partly expelled candles, and elevated by means of hoisting apparatus combined with the stand of molds, for the purpose of drawing the candles out of the molds, substantially as described.

Third, The combination and arrangement of the movable arms, M, on the tip mold frame, F, with the seats, k, and guide, l, on the stand of molds, and the seats, m, on the sliding frame, H H', as and for the purpose set forth.

Fourth, The wick holders, P, constructed and arranged upon the stand of molds, in the manner described.

30,608.—Elliot Andrus, of Geneva, N. Y., for an Improvement in Apparatus for Drawing Water from Wells:

I claim the arrangement and combination of the several parts, for the purpose and to accomplish the result, as above specified, of emptying a bucket.

30,614.—L. A. Colbert, of Baltimore, Md., for an Improvement in Warming Apparatus:

I claim the adaptation and arrangement of a warm air reservoir or receiver, A', of box or niche form, and furnished with a door, B, a bottom passage, C, a side dampered passage, E, and a top dampered passage, F, all for use in combination with the ordinary furnace, hot air flue, draught or chimney flue, and flue leading into elevated chambers, substantially in the manner and for the purposes set forth.

30,616.—G. D. Colton, of Galesburg, Ill., for an Improvement in Apparatus for Drawing Water from Wells:

I claim the employment of the shaft, D, the cylinder, E, the lever, F, the ratchet wheel, a, and the ratchet, c, together with the stop, n, the several parts being constructed and arranged substantially as and for the purpose specified.

30,621.—H. Wm. Dopp, of Buffalo, N. Y., for an Improvement in Vapor Lamps:

I claim mingling the vapor formed with atmospheric air above the burner, as at a a, Figs. 1 and 3, the vapor and the air descending through the pipe, A, to be burned at the burner, B, as and for the purpose specified.

30,631.—David Johnston, of Eddyville, Iowa, for an Improvement in Water Elevators and Carriers:

I claim the arrangement of the track, carriage, hollow pin, bucket, knot, rope, pulley, A, and latches, B and D, when the whole is constructed, arranged and operated in the manner and for the purpose set forth.

30,637.—T. J. Mayhall, of Roxbury, Mass., for an Improvement in Machinery for Making India Rubber Hose:

I claim the use of a series of rollers having curved peripheries, which bear upon and work the coating or covering of india-rubber or gutta-percha into the surface of the woven tube placed upon a suitable mandrel, substantially as described.

30,657.—H. F. Phillips (assignor to Downs & Co.,) of Seneca Falls, N. Y., for an Improvement in Apparatuses for Drawing Water from Wells:

I claim the combination and arrangement of the pivoted movable frame, A, or its equivalent, for sustaining the shaft, f, and main pulley, G, with the stationary pulley, j, weight, K, and bucket, D, and catch lever, L, substantially as and for the purposes set forth.

RE-ISSUES.

F. H. Bartholomew, of New York City, for an Improved Method of Governing the Action of Valve Cocks, Patented June 20, 1854:

I claim, first, The combination of these three elements or devices, viz.: 1st, a variable chamber provided with proper apertures for admission and discharge of fluid; 2d, two valves acting to open and close a passage through which water may flow, the one being on its seat or closing the passage, when the variable chamber is of largest capacity, and the other being in a like position or performing the same office when the capacity of the chamber is smallest; and, 3d, a proper connection between the valves and the variable chamber, so applied that the motions of the former shall be controlled by the latter, the whole three being constructed and acting in combination substantially in the manner and for the purposes described, when operated upon by any competent force.

Second, I claim the combination of two valves, a variable chamber and a connection between them all, substantially such as last enumerated, with a seat or platform, substantially such as is described, by means of a connection, substantially such as set forth, whereby the seat or platform, the valves and the variable chamber, all act in unison, substantially as set forth.

Third, As a means of preventing concussions on pipes supplying urinals or hopper closets where the amount of water used is not a material consideration, and where yielding seats or platforms are employed to open a supply valve, I claim the combination, substantially as described, of a variable chamber, a single valve and a yielding seat or platform, with proper connections and attachments, so that the motions of the valve may be caused by the seat and governed by the variable chamber, substantially as described.

Fourth, I claim the combination of a diaphragm, performing the duty of a stuffing box, with a valve or valves and with a variable chamber controlling the valve or valves, the whole constructed and operating substantially as recited.

F. H. Bartholomew, of New York City, for an Improved Method of Governing the Action of Valve Cocks, Patented June 20, 1854:

I claim, as my own invention, the following devices in combination, viz.: First, A pan provided with a proper rockshaft arm, or its equivalent.

Second, A valve or cock to open and close a passage way leading from a street main or its equivalent, to a basin of a pan closet.

Third, A variable chamber connected with the valve so as to control its motions in either or both directions by retarding either its opening or closing or both.

Fourth, A spring, or its equivalent, compressed when the valve is opened and expanding to close the valve when the pressure upon the spring is released.

Fifth, A lever so connected to the pan and to the valve as to open both when force is applied to the lever; and,

Sixth, A counterbalance, or its equivalent, acting to raise or shut the pan, but not operating to close the valve; intending to claim none of these parts separately, but in combination only, and where all of them are constructed and operate in combination substantially as described.

THE COAL TRADE OF PENNSYLVANIA—A NEW ENTERPRISE.—The Pennsylvania Railroad Comapny and the Reading Railroad have had made for joint use three hundred railroad cars, and purpose to double this number, to be used in carrying coal from the Broad Top Mountain coal mines, near the line of the Pennsylvania railroad, about one hundred miles west of Harrisburg, to Philadelphia. This trade will be carried on over the Pennsylvania Railroad to Harrisburg, where it will enter on the Reading Railroad Company's Lebanon Valley Branch, thence to Reading, and by the Reading Railroad to that Company's wharves at Richmond. This trade now affords a tonnage of about three hundred tons, and, it is said, can be very considerably increased The two carrying companies pro-rate the charges, the Reading having about fifteen miles most of the distance. By the reunion of the two companies in this work, the advantage of a favorable grade is secured the entire distance, and in this respect enables the trade of the Broad Top to compete with rival producers in the best and largest markets. From Huntingdon to Harrisburg the grade of the Pennsylvania Railroad is descending, and from Harrisburg by way of the Reading it is also favorable for heavy trains; whereas from Harrisburg eastward, by way of the Pennsylvania Railroad, the grade is undulating, and in other respects not as well suited for heavy freight. This fact, with a desire of those interested in the trade to have an outlet for their coal on the Delaware, at Richmond, will account for the trade taking the course mentioned.

WATER IMPREGNATED WITH LEAD.—According to the London *Times*, water impregnated with lead may be made wholesome by means of well-burnt charcoal—animal charcoal—which may be used either in the manner of the whiting recommended by Dr. Faraday, namely, by stirring up the charcoal on the water and allowing it to subside, or by filtering in the water through a vessel containing the charcoal in coarse powder. An apparatus in a very portable form has been recently invented for the purpose of applying charcoal to the purification of water from both lead and organic matter, and, after having been subjected to very severe tests, is found to act very satisfactorily. It can easily be attached to the supply pipe of a cistern, and thus used at the time of drawing the water. The composition thus used as a purifying medium is a mixture of animal charcoal, silica, and iron, and although it is sufficiently porous to permit water passing through as rapidly as by any known method of filtration, it does not allow of the impurities penetrating below its extreme surface, from which they can be removed at any period by a brush or cloth. The solidity and indestructibility of this purifying medium are also mentioned as qualities preventing its becoming deteriorated or out of order.—*Phil. North American.*

GAS-FIXTURES.

JOHN COX & CO., No. 696 Broadway, cor. of Fourth street, New York. Importers of French and English Gas Fixtures of every description, Paris Clocks, Real Bronzes, &c. Manufacturers of Silver Ware.

TIFFANY & COMPANY, Jewelers and Importers of elegant artistic PARIS GAS CHANDELIERS, BRACKETS, PENDANTS, &c., in Bronze and Gilt.
No. 550 BROADWAY, NEW YORK.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform the public that they continue to Manufacture all kinds of Gas Fixtures, Lamps, Girandoles, Bronzes, &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited to call and examine.

GAS FIXTURES TO BE SOLD at Wholesale Prices.—In consequence of alterations in his store, the Subscriber is obliged to dispose of his entire stock of Gas Fixtures. Those wishing to purchase at very low prices will do well to call. Gas Fixtures removed. Gas fitting executed in all its branches.
J. H. VAN BEKD, 219 Ble

GAS-FIXTURES.

Gas Fixtures and Fittings. RINGUET-LEPRINCE & L. MARCOTTE, Warehouse, 347 Fourth street.—Manufactory, 55 West Sixteenth street, New York.
RINGUET-LEPRINCE, 3 Rue de la Paix, Paris.
Painting, Paneling, Cabinet Work, Looking-Glass Plates, Mirror Frames, Silk, Worsted and Woolen Materials, Aubusson and Moquette Carpets, Gas Fixtures, Bronzes &c.

GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

WATER HOSE.

LEATHER HOSE, for Fire Engines, Steamboats, Factories, Street Washers, &c., manufactured from the best oak-tanned leather, with wrought-copper rivets, always on hand and for sale by
STEPHEN S. VANDERHOFF,
Late John H. Bowle & Co., 25 Ferry-st., N.Y.

CANVAS WATER HOSE—Woven whole and coated on the inner side—a new article, equal to leather even for Fire Engines, where it has been thoroughly tested, costing about one half. For sale in lots to suit purchasers, of all sizes, by
FOX & POLHEMUS,
59 Broad street, cor. Beaver.

ROOFING.

ROOFING SLATES of the Eagle Slate Company, are of superior quality, low cost, fire-proof, yield pure and untainted rain water, and last a lifetime. Builders address the agent of the Company,
G. FURMAN,
37 Cortlandt-st., N.Y.

PATENT ASPHALTE ROOFING and SHIP SHEATHING FELTS, the cheapest, best, and most durable ever offered to the public. Circulars, samples, &c., will be forwarded free. Agents wanted for city and towns. None genuine unless purchased of AARON A. DEGRAUW, 242 South street, our sole agent for the United States.
CROGGON & CO., London.

WATER-METERS.

H. R. WORTHINGTON'S Patent Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
28 Broadway, N. Y,

COAL-OILS.

TO COAL OIL REFINERS.—Having made arrangements with the Proprietor of the principal wells yielding Petroleum, or Seneca Oil, in the State of Pennsylvania, we are constantly receiving supplies, and are prepared to offer this article on the most favorable terms, and in quantities to suit purchasers. SCHIEFFELIN BROTHERS & CO.,
170 William street

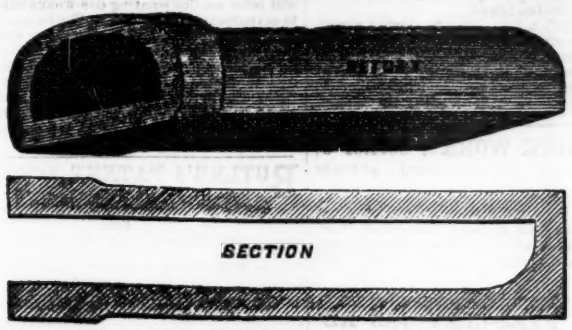
MISCELLANEOUS.

COAL OIL.—A Practical treatise on Coal, Petroleum, and other distilled Oils, by Abraham Gesner. 8vo., illustrated. Cloth, $1 50.
Sent free by mail on receipt of the amount.
BAILLIERE BROTHERS,
440 Broadway, New York.
BAILLIERE BROTHERS keep always on hand a complete assortment of all new books on Chemistry and the Sciences.
Catalogues sent gratis on application.

PLASTIC CARBON FILTERS.—The most simple, effective and reliable means of purifying water without trouble or loss of time; may be used for all domestic and manufacturing purposes, and will be furnished in various sizes, by
A. G. SCHELLER,
No. 36 Beekman street,
New York

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

HARRIS & PEARSON,

PROPRIETORS OF

BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

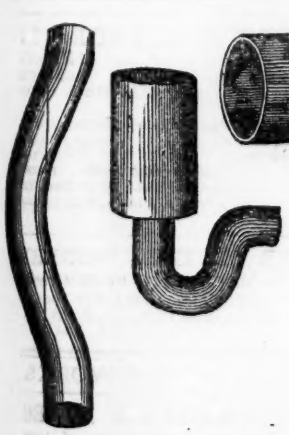
CODE, HOPPER & GRATZ,

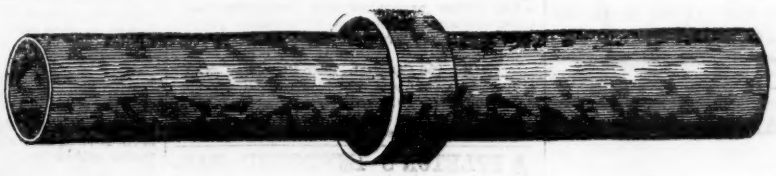
1500, 1502 and 1504 FILBERT-St., PHILADELPHIA.

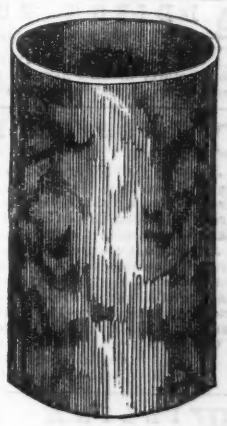
MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensiv addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch. and in all cases *Guarante Entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing itsuperior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.







D. E. HILL,

MIDDLEBURY, SUMMIT CO., OHIO,

MANUFACTURER OF

SEWER-PIPES,

IN ALL ITS FORMS OF

Branches, Junctions, Curves, Elbows, Stench-Traps, &c., &c.

WARRANTED EQUAL TO THE BEST ENGLISH PIPE.

GENGEMBRE'S PATENT

NON-FREEZING AND NON-EVAPORATING

GAS-METER FLUID.

By the use of this Fluid, the WET GAS-METER of ordinary construction is rendered the most perfect and most reliable Gas-Measuring Instrument ever offered to Gas Companies. In winter the Meter will continue to work equally well, *however exposed it may be*; and in summer, the level of the Fluid remaining constant without refilling, the measurement of the Gas will be both uniform and constant.

The use of this Fluid is both easy and economical, and Gas Companies desirous of using it, will be licensed on liberal terms. For further particulars, and certificates of parties having used the same for over three years, and for city rights, apply to

A. DOISY, Box 1180,

General Agent and Attorney for GENGEMBRE'S PATENT.

N. B.—No Sales of Territorial right, or Licenses for using my Patent will be valid, without being ratified by my Signature, as I have no Agent authorised to execute the same.

M. P. GENGEMBRE, PATENTEE,

Box 43, Allegheny City, Penn.

MISCELLANEOUS.

OFFICE OF THE BROOKLYN, N. Y., GAS-LIGHT CO., 136 Remsen street.

NOTICE TO GAS CONSUMERS AND THE PUBLIC.

Having received information at this office, that reports are industriously circulated in relation to the condition of the works and management of Company, calculated to mislead the public—

The Directors respectfully give notice to all concerned, that, anticipating the wants of the city, and availing themselves of the latest improvements in gas-making, they have largely extended their works, and increased their ability to manufacture Gas, and are in a condition to supply any demand that may be made on them.

We shall continue to furnish our customers, in all parts of the city where our mains are laid, Gas of the established quality supplied for years past; and, as the business will justify it, shall extend mains through other parts of the city; and, while by every honorable means, we shall endeavor to retain the business we already have, if it should become necessary to reduce the price of gas in any part of the city, to meet local opposition, in no event will the price exceed the present rate.

V. T. HALL, Sec. R. NICHOLS, President.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies, For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam stops.

HENRY R. WORTHINGTON,
28 Broadway, N. Y.

MISCELLANEOUS.

TO IRON FOUNDERS.—Wanted, Proposals for Castings weighing from 50 to 2,000 pounds, Apply to A. J. WHITE, 10 Cortlandt street, N. Y.

HARPER & O'CONNELL, Manufacturers of Gas Shades and Globes, of every description. FRENCH COLORED GAS SHADES AND SMOKE BELLS Nos. 63 and 65 Elizabeth street corner Hester, New York.

CLAY RETORTS.

CLAY RETORTS.—J. K. BRICK & Co.—Brooklyn Clay Retort and Fire-Brick Works, Van Dyke, near Van Brunt street, Brooklyn, N. Y.—Manufacturers of Clay Retorts, Fire Brick, Gas and Hot House Tiles, Arch, Furnace and Cupola Brick, Fire Cement, Mortar, &c.

J. K. B. & Co. would invite the attention of Gas Companies to the important fact, that the Clay Retorts manufactured at their Works can be set without Tiles, requiring to be supported only at the front and rear ends, thereby exposing the entire surface of the Retort to the direct action of the flame from the furnace.

The results of this mode of setting, are a Saving of Fuel, Tiles, Transportation of Materials, Labor and Space, thereby enabling Gas Companies to set Retorts of at least 50 per cent. greater capacity than those usually employed in the ordinary arches.

ENGLISH FIRE BRICKS, Rufford's Stourbridge Bricks, Stourbridge and Welsh Clay.
S. THOMPSON'S Neph., Imp'r,
45 Gold-st.

ELLIMAN BROTHERS, 217 Pearl-St., New York, Commission Merchants, Importers of
BELGIAN FIRE-CLAY GAS RETORTS,
Dealers in Tiles, Arch-Bricks, Furnace-Doors, Mouth-Pieces, Covers, and all other Fittings, of the most approved patterns, for setting Clay Retorts. Sabbaton's Patent Furnace-Doors and Frames, Floyd's Patent Malleable Iron Retort Covers, McKenzie's Patent Gas Exhausters, made by Addison Smith, Compensator Valves, &c. Gas, Water, and Steam Tubes

GAUTIER'S CLAY RETORTS.—Fire and Arch Bricks, Gas-House Tiles, &c. Black Lead Crucibles for Steel Works and Brass Founders.
MANY, BALDWIN & MANY, 49 John-st., N. Y.

KENNEDY'S Method of Securing Iron Mouth Pieces to Clay Retorts.—The Retort is made in the usual form, but without any bolt-holes through the flange. An iron collar made in two pieces, is then placed around the Retort behind the flange, and bolted to the mouth-piece by bolts which pass just outside of the flange instead of passing through it. As each Retort costs about $30, and as the breaking out of the bolt-holes entirely ruins the whole Retort, the importance of this simple but valuable improvement will be readily appreciated.

By this improvement the mouth-piece is firmly attached to Clay Retorts in a simple and very substantial manner, the bolts passing from the yoke to the mouth-piece on the outside of the Retort. The yokes are furnished at a low price, ready to be put on. For Engravings, see American Gas-Light Journal for June, 1860, page 245. Address the Patentee,
JOHN P. KENNEDY, Trenton, N. J.

ADDISON POTTER,
Willington Quay,
Near Newcastle-upon-Tyne, England,
Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay goods.

COWEN'S PATENT FIRE-CLAY Retorts.
JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "Gas Retorts and Other Objects in Fire Clay."

J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.
COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke office,
Quay Side, Newcastle-on-Tyne.

WILLIAM RYDER, General Mineral and Metal Agent and Merchant, 4 Dean street, Newcastle-on-Tyne, England, is prepared to supply Gas Companies and others with every variety of appliance for the production and supply of Gas, including Gasometers, Retorts (metal and clay), Fire Bricks, Coals, Metal Mains, Tubes, in wrought iron, copper, brass, lead or composition, Meters, Taps, Fittings, &c., &c.; and from his extensive experience in this class of work, can guarantee every thing of the best description.

JOHN ROGERSON & CO., Newcastle on-Tyne, Middlesbro'-on-Tees, London, supply Gas Coal, Clay Retorts, Cast Iron Pipes and Retorts, Gasometers, &c. A partner of the above house being now in this city, will be glad to wait upon any gas company requiring supplies. Agents, MEAD & BELL,
17 William street, New York.

CLIFF'S ENGLISH CLAY RETORTS,
Retort-Covers, Gas-Exhausters, Furnace Doors, Castings, Implements, Photometrical and Meter-Proving Apparatus.
T. W. PARMELE, Sole Agent,
No. 4 Irving Place, New-York.

CLAY RETORTS.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER & CO, office 56 Goerck street, corner Delancy street, New York.
Gas-House Tiles and Fire Brick of all shapes and sizes. Fire Mortar, Clay, and Sand articles of every description made to order at the shortest notice. B. Kreischer, M Maurer, A. Weber

FIRE-BRICK WORKS, corner of Vine and Twenty-third streets Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of Fire-Brick, Gas-House Tiles, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PATENT PYRO-CLAY GAS RETorts. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-engineers to these Retorts, as a very superior article.
References:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY 34 Front st., Cleveland, O.

IRON RETORTS.

CELLULAR GAS-RETORTS. C. M. CRESSON'S CELLULAR GAS Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth streets, Philadelphia, Pa.

FOR SYMMES' PATENT REtorts, Mouthpieces, &c. address—
ELLIMAN BROTHERS, 217 Pearl-st., New York.
MORRIS, TASKER & CO, Philadelphia.
HORATIO EAGLE, 126 Malden Lane, N. Y.
Or H. K. SYMMES, Newton, Mass.
See Engravings in American Gas-Light Journal for July 1, 1860, page 280.

GAS, WATER FITTINGS, &C.

LANE & ANNIN, GAS, WATER and Steam Fittings,
88 JOHN-St., Cor. of GOLD,
NEW-YORK.
Manufacturers of the best quality of all the varieties of Connections for Iron Pipes; both Malleable, Wrought and Cast Iron. Also Meter Cocks, Lamp Cocks, &c.

Also, sole manufacturers of a New Meter Cock, which connects with Lead Pipe, forming a perfect joint without solder. Also, a connection for Lead pipe, without the use of solder.

GALVANIZED FITTINGS FOR PLUMBERS.

Wrought Iron Pipe of best quality, for sale Orders solicited.

CONTRACTS MADE FOR HEATING BUILDINGS BY STEAM.

CARDS.

NATIONAL DIRECTORY
OF
Gas & Steam Fitters & Plumbers.

ALBANY, N. Y.
WILLIAM MUNSIG, **623 Broadway.**
ALEX. B. SHEPARD, **17 South Pearl St.**

BALTIMORE, MD.
BLAIR & CO., **366 W. Baltm'e St.**
GRATTAN & EVANS, **8 North St.**
J. H. McCALL & CO., **15 W. Fayette St.**
JOHN RICHARDS, **274 W. Baltm'e St.**

BOSTON, MASS.
J. KENNEDY, **45 Maverick Sq.**
W. WILTSHIRE, **46 Devonshire St.**
N. P. WOODMAN, **13 Haverhill St.**
J. B. WRIGHT, **28 Devonshire St.**

CINCINNATI, O.
BAKER & VON PUHL, **64 Fourth St.**

NEW YORK.
JAMES HELME **58 East 13th St.**
WM. TOWERS, **31 Carmine St.**
GEO. C. ELLISON, **859 Broadway.**
B. M. JOHNSON, **111 East 18th St.**
LOCKE & CRAIGIE, **12 East 20th St.**
McKENZIE & O'HARA, **326 Fourth St.**
ANTHONY KENDALL, **258 W. 36th St.**
DAVIS B. LANE, **167 William St.**
F. B. LANGWITH, **63 White St.**
FRANCIS MATTHEWS, **47 Ann Street.**
CHAS. F. MERRITT, **156 Seventh Ave.**
WM. PALMER, **408 Eighth Ave.**
GEORGE E. PARKER, **156 Seventh Ave.**
DAVID REA, **48 Cortlandt St.**

PORTABLE GAS-WORKS.

THE AUBIN GAS-WORKS CO., No. 44 State street, Albany, N. Y., will refer parties wanting Gas-Works for Villages to seventeen of their Village Works now in operation in the United States and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the Aubin Portable Gas Stove for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

BUTLER'S PATENT PORTABLE ROSIN GAS-WORKS,
FOR
DWELLINGS, CHURCHES, COUNTRY VILLAGES
As well as for Consumers in Large Cities.
JOHN BUTLER,
No. 112 Fulton-st and 15 Henry-st.,
Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
Apply to the
NEW YORK CAR & STEAMBOAT GAS CO.,
No. 117 Fulton st., N. Y.

C. R. WOODWORTH,
Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET, New York City

PORTABLE GAS WORKS.—S. T. McDougall's Patent Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines

GAS FOR THE COUNTRY.—C. Wooster, Manufacturer of Improved Portable Gas Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.

This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.

Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.

For further particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address
C WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.
For Engravings, see American Gas-Light Journal, for June, 1860, page 245.
☞ Responsible Agents wanted, with whom liberal arrangements will be made.

APPLETON'S IMPROVED GAS-Works, for Factories, Hotels, Dwellings, and Towns. The most simple and economical works in use, furnishing a superior light to coal gas at a cost of one half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms apply to APPLETON & GRAHAM,
56 Washington street, Boston.
For Engravings, see American Gas-Light Journal for April, 1860, page 213.

ROSIN GAS-WORKS, for Factories, Hotels, and Public Buildings. These works may be seen in operation at the Berkshire Woolen Mills, Great Barrington, Mass.; Manchester Mills, Manchester, Conn.; A. A. Van Alen & Co's. Factories, Stvesant Falls, N.Y., and many other places JAMES O MORSE & CO.,
76 John-st., New York.

MARSH'S PATENT ROSIN or Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
241 Broadway New York.

GAS-METER FLUID.

FLUID for GAS METERS.—The undersigned is prepared to furnish the Glycerine meter fluid in quantities to suit purchasers: *it does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*
For particulars, references, &c., address the manufacturer. HENRY BOWER,
Box 325, Philadelphia, Pa.

IRON FOUNDRIES.

S. V. Merrick, J. Vaughan Merrick,
W. H. Merrick.

SUTHWARK FOUNDRY, Philadelphia.
MERRICK & SONS, Engineers, manufacturers of every description of Gas Machinery.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

MORRIS, TASKER & CO., PASCAL IRON WORKS,
[ESTABLISHED 1821]
Philadelphia, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap Welded Boiler Flues,
Galvanized Wrought Iron Tubes,
ARTESIAN WELL PIPES,
of Wrought or Cast Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal gas works; Cast Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
Stephen Morris, Chas. Wheeler,
Thomas S. Tasker, Stephen P. M. Tasker.

BERGEN IRON WORKS, Established 1833.
R. A. BRICK, Manufacturer of Cast-Iron Water and Gas Pipes. Retorts, Pipes, &c., always on hand, Office 109, Leonard street, New York.

OREGON FOUNDRY, Nos. 740, 742, 744 Greenwich street, New York.
HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, costing less than half those of English manufacture, also castings of every description for Gas and Water-Works.

Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see American Gas Light Journal for October, 1859, pages 65 and 71.

Samples of the above castings can be seen at the Rooms of the American Gas-Light Journal.

COLWELL & CO., Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, No. 207 North Water street and 206 North Wharves, Philadelphia.
STEPHEN COLWELL, W. DWIGHT BELL,
THEO. TREWENDT, SAMUEL FULTON.

TRANER & MERCER, 117 North Water street, and 124 North wharves, Philadelphia, Agents for Florence & Mercer Foundries, Elk Stree Iron Works
Cast Iron Street Mains; *Bends, Branches, Chemical Retorts, and all kinds of Castings for Gas-works*, either Coal or Rosin Works. Sheet Iron for Gasometers *cut and punched to order.* Boiler Iron *of all descriptions.* Russia Sheet Iron, Tin Plates, Block Tin, Copper, Pig Lead, Spelter, and Metals generally.

GREENE ST. IRON FOUNDRY and Machine Shop, 37 to 43 Greene street, (Office, No. 39) near Grand, New York.
Cast Iron Soil and Drain Pipe, Tees, Bends, &c.
A. & E. B. BRADY.

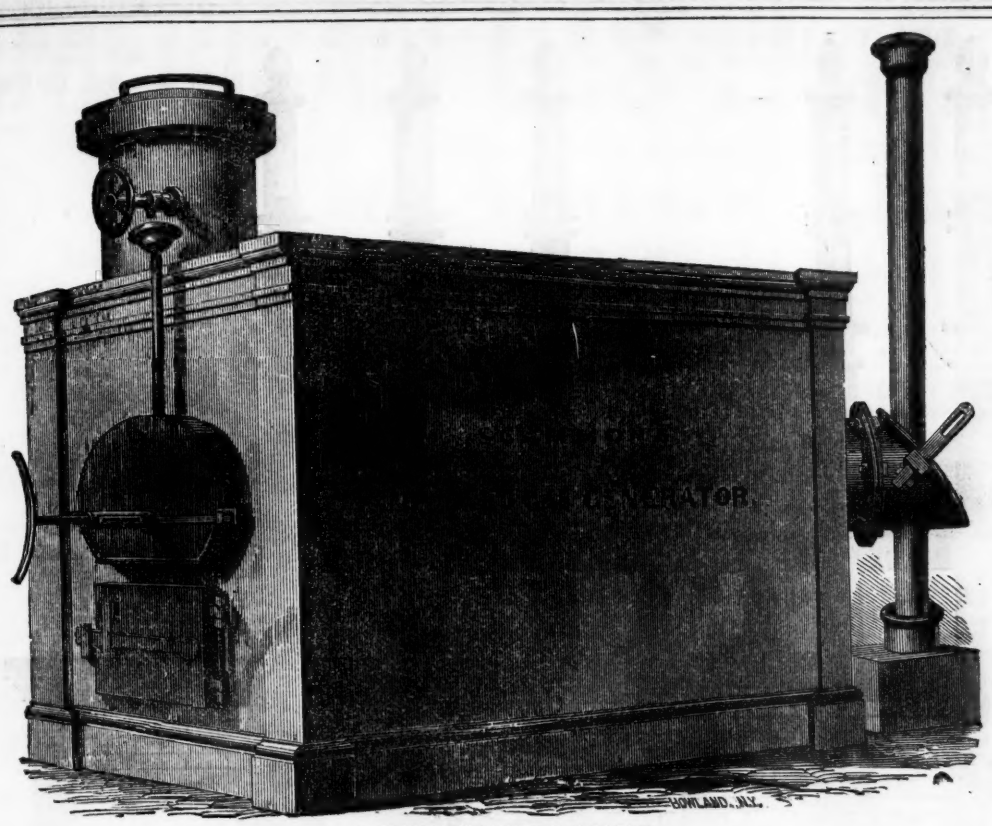
BUILDERS OF GAS-WORKS.

WATERHOUSE & BOWES Raleigh, N. C. Builders of Gas Works in Southern States. The following Gas-works have been built by them, and are their references.

Charlotte, N. C.	Jacksonville, Fla.
Raleigh, N. C.	Fayetteville, N. C.
Salisbury, N. C.	Staunton, Va.
	Waverly, Miss.

DIMMOCK, DWIGHT & CO., Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York city; and No. 2 Elm street, Springfield, Mass.
References by permission:
George D. Morgan, Esq., New York.
Aaron Claflin, Esq., "
A. B. Wood, Esq., "
George Bliss, Esq., N. Y., Pres. M. S. & N. I. R. R. Co
Geo. M. Atwater, Esq., Springfield, Mass.
Jas. D. Brewer, Esq., Pres. Springfield Gas Co.,
John I. Baker, Esq., Pres Beverly Gas Co.,
Henry E. Russell, Esq., Pres. N. Britain Gas Co.,
J. Dunham, Esq., Pres. Norwich, Ct. Gas Co.,
W. C. Street, Esq., Sec. Norwalk Ct. Gas Co.

STEPHEN SCAMMON, Gas Engineer and Contractor for the erection of Gas-Works; also, dealer in Cast and Wrought Iron Pipe for Steam, Water and Gas, No. 61 Broadway, New York.



A PERSPECTIVE VIEW

OF THE

SINGLE RETORT ROSIN GAS-WORKS,

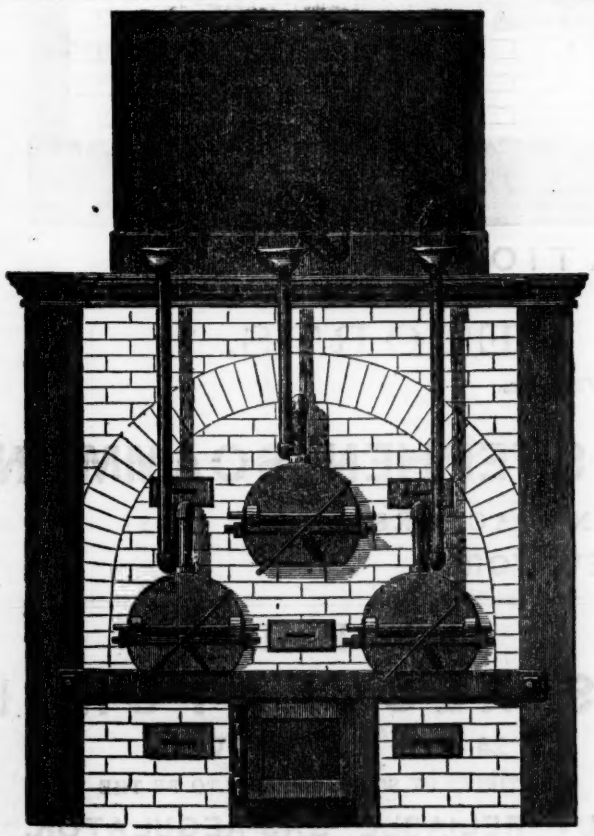
FOR PRIVATE RESIDENCES, FACTORIES, HOTELS, &C.,

MANUFACTURED BY

GEO. H. KITCHEN & Co. and STEPHEN SCAMMON,

GAS-ENGINEERS AND CONTRACTORS,

561 BROADWAY, NEW YORK.



FRONT ELEVATION

OF A

BENCH OF THREE ROSIN RETORTS,

ADAPTED FOR LARGE PUBLIC BUILDINGS, VILLAGES, &c.

EO. H. KITCHEN & Co. and STEPHEN SCAMMON,

GAS-ENGINERS AND CONTRACTORS,

561 Broadway, New York.

MISCELLANEOUS.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweighsi such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

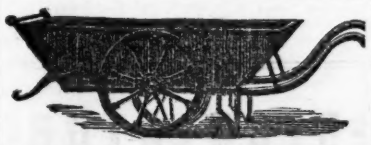
BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address

P. T. BURTIS,
Engineer Gas-Works, Chicago, Ill.

McKINNY & KELLY,

MANUFACTURERS OF

COAL-SCOOPS & COKE-BARROWS.



FURMAN-St., Near Fulton Ferry, Brooklyn, N. Y

WOODEN TRAYS FOR GAS-PURIFIERS.—JOHN L. CHEESMAN, No. 147 Avenue C, near Tenth street, New-York, manufactures his Patent WOODEN TRAYS for GAS-PURIFIERS, *cut out of the solid wood*, superior to the ordinary iron plates, cheaper and more durable. The attention of Gas Companies and Engineers is called to this improvement, which has been adopted by the following Gas Works:

Albany, N. Y.,	Manhattan, N. Y. City,
Chicago, Ill.,	Philadelphia, Penn.,
Williamsb'gh, N.Y.,	Worcester, Mass.

See Engravings on page 148, Vol. II.

A NEW AND SUCCESSFUL GAS-WORKS, in the State of New York, FOR SALE. It paid Eight per cent. in the first six months. Address, for further particulars,

G. P. GERARD,
at Rooms of AMERICAN GAS-LIGHT JOURNAL,
254 Canal street, New-York.

TO CONTRACTORS

OFFICIAL.

OFFICE LIGHTHOUSE BOARD.
U. S. Treasury Department, Washington, D. C., Oct. 22, 1860.

Sealed Proposals will be received at this office until 12 o'clock M. on Monday, Dec. 3, 1860, for one IRON LIGHT-HOUSE FOR CAPE CANAVERAL, FLORIDA.

Drawings and specifications may be obtained at the office, or at the following named places:

New York city—No. 43 Cedar street.
Boston, Mass.—No. 1 Commercial wharf.
Philadelphia—Cor. of Girard and Twelfth-sts.

By order of the Lighthouse Board.

Capt. WM. F. SMITH, Engineer Secretary.

OFFICIAL.

NOTICE.—Supply of Water for the CITY OF ROCHESTER—In pursuance of a Resolution of the Common Council, notice is hereby given, that Sealed Proposals will be received by the undersigned, at the City Clerk's Office, until noon of Tuesday, the Fourth day of December next, for furnishing a supply of Water from Hemlock Lake, for the following purposes:

For not less than four hundred Fire Hydrants.

For the City Hall, not less than ten fountains for the Parks and Public Squares, and for not less than twenty Public Schools.

For the Hospitals and Public Markets. According to the plan No. 4 or 5 of the Report of Daniel Marsh Proposals should before sum certain, as to the price to be paid annually by the city for the proposed supply, and should contain a full and explicit specification of the work, in all its parts and details, relative to kinds and qualities of the materials to be used, and the extent, size and strength of all portions of the work.

Fire Hydrants of an approved form and character, should be specified in the proposals.

A guarantee, with an approved bond, will be required that the works will be of such approved character as to ensure a constant supply of water to the city. The city of Rochester will incur no expense or responsibility for the right of way, or on account of the waters to be appropriated and used, beyond the sum stipulated to be paid annually for the proposed supply of water. No transfer of any constract or claim arising from proposals for a upply of water, will be recognized or allowed.

The contracting party will be required to give ample security that the work shall be commenced by the first day of May, 1861, and completed by the first day of October, 1862.

☞ The Common Council reserve the right to contract with such parties as will best serve the interests of the city.

☞ Copies of the Report of D. Marsh, referred to above, may be found at the office of this paper.

Communications may be addressed to Daniel Marsh, Esq., or the Chairman of the Committee.

GEO. SHELTON,
E. N. BUELL,
P. BARRY. } Committee.

F. S. REW, Clerk.

Rochester, N. Y., October 20, 1860.

TO GAS COMPANIES AND CONTRACTORS.—For Sale: Two sets Dry Lime Purifiers, 14 feet by 12 feet, 5 tiers of plates, 12 inch connections; and one Set Purifiers, 10 feet by 5 feet, 5 tiers of plates, 8 inch connections. A Station Meter, (square case) 8 feet front, 8 feet deep, and 7 feet high; register a 250,000 feet per diem. Also a quantity of Bench Castings, consisting of Sections of Hydraulic main, (D shaped pattern,) Stand, Bridge and Dip Pipes, together with a number of Composition-faced Slide Valves, various sizes, from 6 inches to 16 inches diameter.

Address the ENGINEER OF THE MANHATTAN GAS-LIGHT COMPANY, Foot of 18th-st., N. R., New-York

FINANCIAL.

OFFICIAL.

PROPOSALS FOR $275,000 of THE CROTON WATER Stock of the City of New York.

Sealed proposals will be received at the Comptroller's office, until Friday, December 14, 1860, at 2 o'clock P. M., when the same will be publicly opened, for the whole or any part of the sum of two hundred and seventy-five thousand dollars of the Croton Water Stock, of the City of New York, authorized by Chap. 372 of the Laws of 1860 and by an ordinance of the Common Council, approved by the Mayor, August 9, 1860, for increasing the supply of Croton Water, and extending the necessary works for accumulating and distributing the same.

The said stock will bear interest at the rate of six per cent. per annum, payable quarter-yearly, and principal will be redeemable on the first day of November, 1883.

The proposals will state the amount of stock desired, and the price per one hundred dollars thereof, and the persons whose proposals are accepted, will be required to deposit with the Chamberlain of the city, within ten days after the opening of the bids, the sum awarded to them respectively, including the premiums on the same.

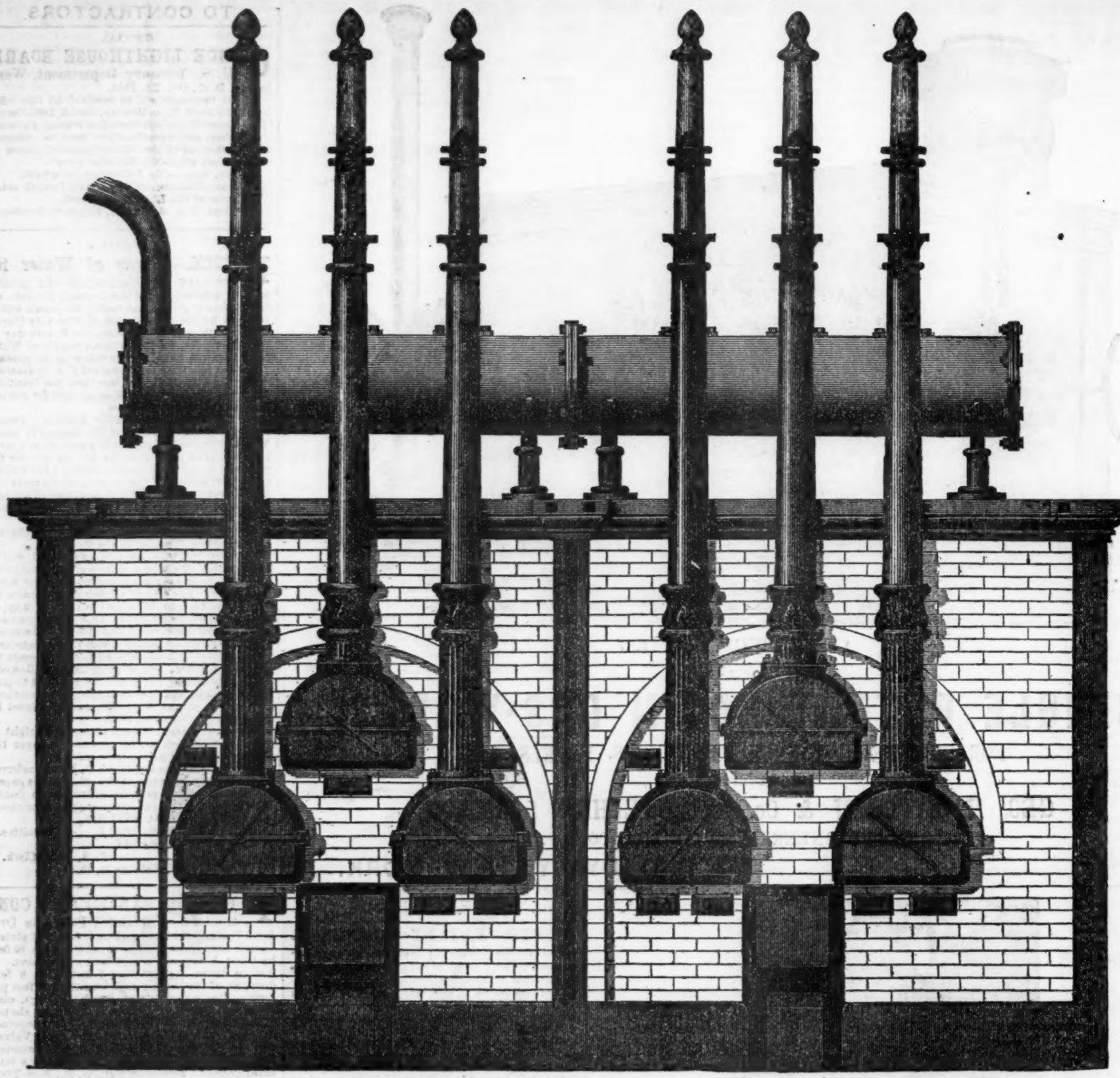
On presenting to the Comptroller the receipts of the Chamberlain for such deposits, the parties will be entitled to receive certificates for equal amounts of the par value of the stock, bearing interest from the dates of payments.

Each proposition should be sealed, and endorsed "Proposals for Croton Water Stock of the City of New York," and to the same enclosed in a second envelope, addressed to the Comptroller.

The right is reserved on the part of the Comptroller to reject any or all of the bids if considered necessary to protect or promote the interests of the city. ROBERT T. HAWS, Comptroller.

City of New York, Department of Finance, Comptroller's Office, Nov. 14, 1860.

GAS-LIGHT STOCKS FOR SALE. THREE HUNDRED THOUSAND DOLLARS of Stocks in various Gas-light Companies in the United States, paying from 6 to 12 per cent dividend, for sale by JOHN B. MURRAY, Rooms of the AMERICAN GAS-LIGHT JOURNAL, N. Y.



FRONT ELEVATION

OF A

BENCH OF COAL RETORTS,

FOR LIGHTING CITIES, TOWNS, &c.,

MANUFACTURED BY

GEO. H. KITCHEN & CO. AND STEPHEN SCAMMON,

GAS-ENGINEERS AND CONTRACTORS,

561 BROADWAY, NEW YORK.

THE

STERLING GAS-REGULATOR

Improves the Light, and Saves a Large per centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING-MACHINE COMPANY.

☞ It is well known that Printers require the best and most brilliant light. In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New-York Times, New-York Herald, New-York World, New-York Tribune, New-York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zeitung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

WHEELER & WILSON SEWING-MACHINE CO.,

505 BROADWAY, NEW-YORK,

To keep in order, and always maintain the pressure of the Gas at the lowest point for a brilliant light, and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

KIDDER'S

GAS-REGULATOR!!!

25 PER CENT. SAVED.

CERTIFIED BY SCIENTIFIC MEN TO BE THE

ONLY RELIABLE GAS-REGULATOR.

The undersigned Sole Agent for the sale of this valuable REGULATOR, is prepared to supply the Trade upon very favorable terms.

Agents Wanted in the Principal Cities and Towns throughout the United States and the British Possessions in North America.

As a Regulator and Economizer of Gas, it has received the highest testimonials. See advertisement in AMERICAN GAS-LIGHT JOURNAL, Vol. 2, No. 20, page 128.

HORATIO EAGLE, 126 Maiden Lane,

Between Pearl and Water streets.